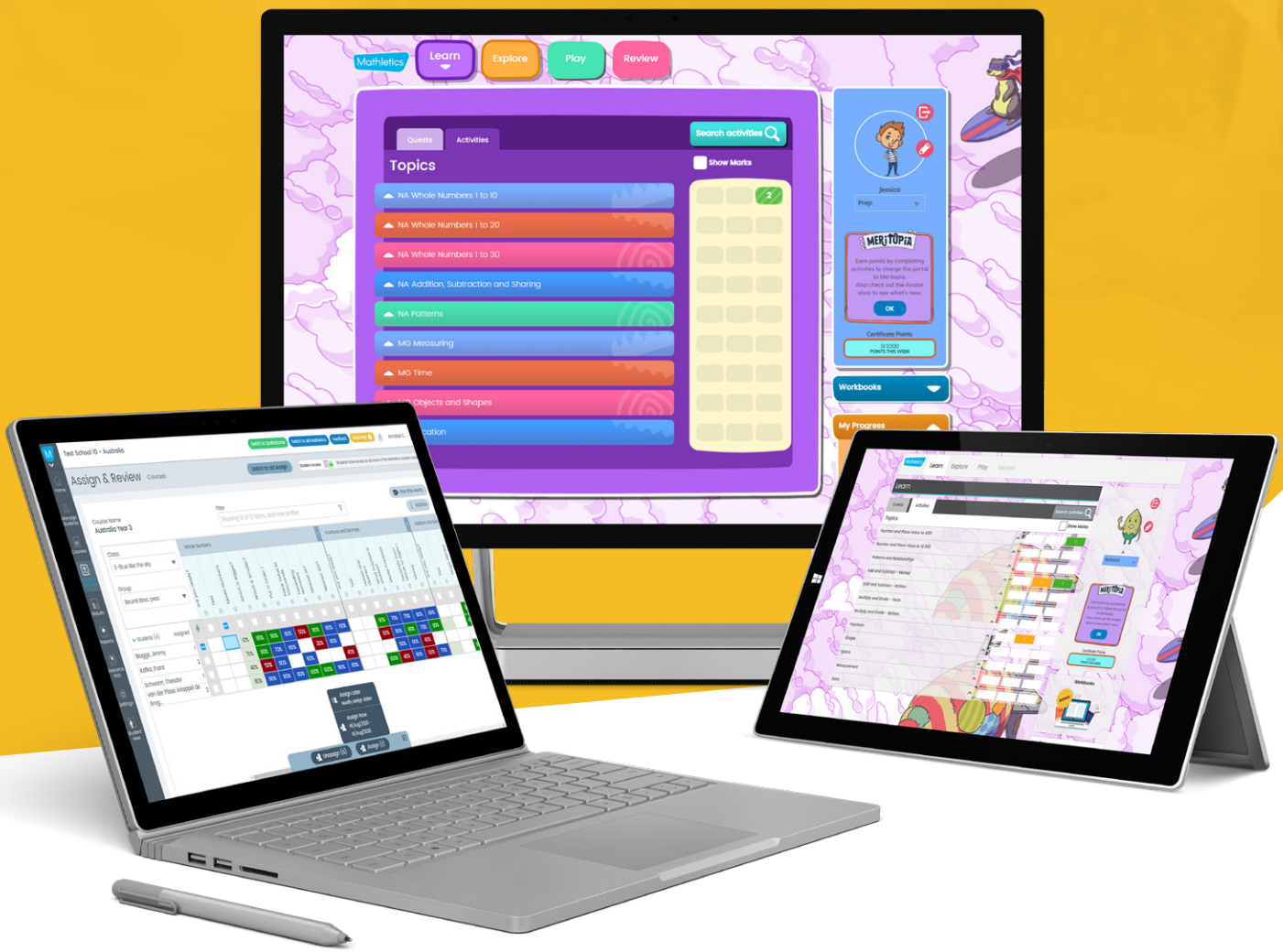
Mathletics
Victorian Curriculum
Understanding Practice and Fluency (UPF)



Years 1 – 8

Mathletics

Victorian Curriculum Years 1 – 8

Mathletics

Content

Thank you for using Mathletics.

We look forward to sharing the love of learning with your school.

Victorian Curriculum Years 1 – 8

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Victorian Curriculum Year 1

Understanding Practice and Fluency (UPF)

Number and Algebra

Develop confidence with number sequences to and from 100 by ones from any starting point. Skip count by twos, fives and tens starting from zero (VCMNA086)			
Quest: Whole number – counting			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Count forwards and backwards to 100	1	Counting forwards in ones within 100	• count forwards in ones from any number up to 100 • identify missing numbers on a number line up to 100
	2	Counting backwards in ones within 100	• count backwards in ones from any number within 100 • identify missing numbers on a number line up to 100
	3	Counting forwards and backwards in ones within 100	• count forwards and backwards in ones from any number up to 100 • identify missing numbers on a number line up to 100
Find numbers before and after to 100	1	Identifying numbers before and after up to 100	• identify the number that comes before a given number up to 100;- describe this number as 'one more than' • identify the number that comes after a given number up to 100;- describe this numbers as 'one less than' • identify the number that comes before or after a given number up to 100;- describe this number as 'one more than' or 'one less than'
Identify ordinal numbers up to 31st	1	Using ordinal numbers up to 31st	• read, write and use ordinal numbers in everyday situations, eg when reading a calendar
Quest: Whole number – skip counting			
Skip count by 2s	1	Using skip counting by 2s from zero up to 20	• use concrete materials, models, drawings, number lines/charts to skip count by 2s from zero
	2	Using skip counting by 2s from any multiple of 2 up to 50	• use concrete materials, models, drawings, number lines/charts to skip count by 2s from any multiple of 2
Skip count by 5s	1	Using skip counting by 5s from zero up to 20	• use concrete materials, models, drawings, number lines/charts to skip count by 5s from zero
	2	Using skip counting by 5s from zero up to 50	• use concrete materials, models, drawings, number lines/charts to skip count by 5s from zero
Skip count by 10s	1	Counting by skip counting forwards by 10s from zero up to 50	• use concrete materials, models, drawings, number lines/charts to skip count by 10s from zero
	2	Counting by skip counting backwards by 10s from up to 50	• use concrete materials, models, drawings, number lines/charts to skip count backwards by 10s
	3	Counting by skip counting forwards by 10s from zero up to 100	• use concrete materials, models, drawings, number lines/charts to skip count by 10s from zero • recognise an error in the skip counting sequence
	4	Counting by skip counting backwards by 10s from up to 100	• use concrete materials, models, drawings, number lines/charts to skip count backwards by 10s • recognise an error in the skip counting sequence
	5	Counting by skip counting forwards or backwards by 10s from zero up to 100	• use concrete materials, models, drawings, number lines/charts to skip count forwards ad backwards by 10s from zero
		Counting by skip counting forwards or backwards by 10s from zero up to 100	• recognise an error in the skip counting sequence

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Understanding Practice and Fluency (UPF)

Number and Algebra

Develop confidence with number sequences to and from 100 by ones from any starting point. Skip count by twos, fives and tens starting from zero (VCMNA086)			
Quest: Whole number – skip counting			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Skip count by 2s, 5s and 10s	1	Counting by skip counting in 2s, 5s, 10s from zero to 50	• use concrete materials, models, drawings, number lines/charts to skip count by 2s, 5s, 10s from zero
	2	Finding 'how many' objects using skip counting by 2, 5 or 10 up to 50	• use skip counting by 2, 5 or 10 to determine 'how many' when objects are grouped or shared equally
	3	Counting by skip counting in 2s, 5s, 10s from zero to 100	• use concrete materials, models, drawings, number lines/charts to skip count by 2s, 5s, 10s from zero
	4	Finding 'how many' objects using skip counting by 2, 5 or 10 up to 100	• use skip counting by 2, 5 or 10 to determine 'how many' when objects are grouped or shared equally
Count collections to 100 by partitioning numbers using place value (VCMNA088)			
Quest: Whole number – counting collections			
Count collections 0 to 100	1	Counting collections 0 to 100	• count everyday concrete materials using one-to-one correspondence
Use groups of 10 to count large collections	1	Using groups of ten to count large collections	• count by systematically organising collections into groups of tens and then skip counting in tens • record and describe the count, eg 'there are 4 groups of ten and 3 left over'
Identify place value up to 2 digits	1	Identifying the place value of digits in 2-digit numbers	• write the numeral for a 2-digit number modelled using place value equipment • identify the digit in the tens or ones column for a given 2-digit number
Solve problems using place value up to 2 digits	1	Solve problems using place value with 2-digit numbers	• identify, record and model a number using place value clues, eg 'a 5 in the tens and a 2 in the ones' as 52 • create the smallest and largest possible number using 2 digits
Partition 2-digit numbers (standard)	1	Using place value to partition 2-digit numbers	• use place value equipment and models, eg tens frames, to partition a given 2-digit number into tens and ones • model and describe a 2-digit number in both words and numerals, eg 53 as '5 tens and 3 ones' or '50 and 3' • model a number expressed in words, eg '6 tens and 2 ones'
Partition 2-digit numbers (non-standard)	1	Partitioning 2-digit numbers using non-standard partitioning	• use place value equipment and models, eg tens frames, to partition a given 2-digit number using non-standard partitioning, eg 35 as 2 tens and 15 ones • model and identify a number from non-standard partitioning, eg recognise 4 tens and 13 ones as 53

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Number and Algebra

Learning Journey	Steps	Spine Nodes	Subnodes
Recognise, model, read, write and order numbers to at least 100; locate these numbers on a number line (VCMNA087)			
Quest: Whole number – place value			
Model, read, write and count 2-digit numbers	1	Representing 2-digit numbers using words, numerals and objects	• write the numerals and words, eg 'fifty three' for a 2-digit number represented using place value equipment or using pictures, drawings
	2	Counting in tens and ones	• count in tens and then ones along a partially labelled number line to place a number, up to 100 • use clues to identify a number on a number line, eg 3 tens and 7 ones as 37 • count in tens and ones on a partially labelled number chart to position a number up to 100
Compare and order numbers to 100	1	Comparing numbers to 100	• model and compare two 2-digit numbers using place value equipment • compare two 2-digit numbers
	2	Ordering numbers to 100	• order up to 4 consecutive numbers within 100 from smallest to largest or largest to smallest;- explain the reason for the order given • order up to 4 non-consecutive numbers within 100 from smallest to largest or largest to smallest;- explain the reason for the order given
Round numbers up to 100	1	Rounding numbers up to 100 to the nearest 10	• model a 2-digit number and recognise which ten it is nearer to;- explain reasoning • round a 2-digit number to the nearest 10;- explain reasoning
Solve problems with 2-digit numbers on number lines	1	Solving place value problems with 2-digit numbers	• use clues to identify numbers on a number line, eg use a number line to find out how many jumps of 10 from 12 make 52 • use clues to identify a number on a number chart starting from any number, eg starting from 14 count on 4 groups of 10 to identify the new number
Recognise, describe and order Australian coins according to their value (VCMNA092)			
Recognise Australian coins	1	Recognising coins | Australia	• recognise the monetary value of Australian coins • order Australian coins by value
Represent and solve simple addition and subtraction problems using a range of strategies, including counting on, partitioning and rearranging parts (VCMNA089)			
Quest: Addition and subtraction			
Model and record combinations that make 5 – 9	1	Modelling and recording combinations that add up to 5	• model and record with numerals, the patterns of numbers that add to 5 • find the missing number to add to 5 when one number is given
	2	Modelling and recording combinations that add up to 6	• model and record with numerals, the patterns of numbers that add to 6 • find the missing number to add to 6 when one number is given
	3	Modelling and recording combinations that add up to 7	• model and record with numerals the patterns of numbers that add to 7 • find the missing number to add to 7 when one number is given

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Number and Algebra

Represent and solve simple addition and subtraction problems using a range of strategies, including counting on, partitioning and rearranging parts (VCMNA089)			
Quest: Addition and subtraction			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Model and record combinations that make 5 – 9	4	Modelling and recording combinations that add up to 8	• model and record the patterns of numbers that add to 8 • find the missing number to add to 8 when one number is given
	5	Modelling and recording combinations that add up to 9	• model and record the patterns of numbers that add to 9 • find the missing number to add to 9 when one number is given
Model and record combinations that make 11 – 20	1	Modelling and recording combinations that add to numbers from 11 to 20	• model and recognise the relationship between numbers to 10 and numbers to 20 using models eg tens frames eg 5 + 4 = 9 and 15 + 4 = 19 • use the additions to 10 to record the combinations of numbers that add to between 11 and 20
Recognise and recall bonds to 10	1	Recognising and recalling bonds to 10	• recognise pairs of numbers that add to 10 • find the missing number to add to 10 given one number • recall and record the bonds that add to 10
Add zero to a number (up to 20)	1	Adding zero to a number (up to 20)	• investigate and recognise the effect of adding zero to a number;- generalise that adding zero does not change the number
Introduce the commutative property of addition	1	Introducing the commutative property of addition	• represent and solve an addition problem both ways using concrete materials and models eg 5 + 4 or 4 + 5 • swap an addition problem around so the larger number comes first and add by counting on (within 20)
Add and subtract by counting on/ back up to 100	1	Counting on and back to add and subtract up to 100	• count on or back to add and subtract with numbers up to 100
Add doubles up to 20	1	Recalling doubles up to 10	• recall doubles and add doubles to 10 fluently
	2	Adding doubles up to 20	• add doubles with and without using models (up to 20)
Add and subtract near doubles	1	Adding doubles or near doubles	• solve addition problems using doubles, eg 4 + 3 + 4 as 4 + 4 + 3 • model and solve addition problems with near doubles, eg 5 + 7 as 5 + 5 + 2 = 12
	2	Subtracting using doubles	• model and solve subtraction problems using doubles, eg 14 - 7 as 7 + 7 = 14 or 15 - 8 as 7 + 7 + 1 = 15
Find the difference between 2 numbers (to 20)	1	Finding the difference between 2 numbers (up to 20)	• represent two numbers using concrete materials and a number line eg place value equipment and a number line;- compare the materials and count from the smaller number to find the difference • find the missing number in an addition problem eg 4 + ? = 9 • solve word problems which involve finding the difference between two numbers
Add compatible numbers (doubles or bonds to 10)	1	Adding using compatible numbers and manipulatives for support	• find compatible numbers (bonds to 10 or doubles) to add a list of 1-digit numbers, eg 6 + 3 + 4 + 3

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Number and Algebra

Represent and solve simple addition and subtraction problems using a range of strategies, including counting on, partitioning and rearranging parts (VCMNA089)			
Quest: Addition and subtraction			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Add and subtract using bridging to 10 up to 100	1	Bridging to ten to add a 1-digit and 1-digit number using models and diagrams	• add to the nearest ten first then add the rest, using models for support, eg 8 + 7 as 8 + 2 = 10 and 10 + 5 = 15 • record the strategy of bridging to ten using numbers and/or models, eg number lines
	2	Bridging to ten to add a 2-digit and 1-digit number using models and diagrams	• add to the nearest ten first then add the rest, using models for support, eg 28 + 7 as 28 + 2 = 30 and 30 + 5 = 35 • record the strategy of bridging to ten using numbers and/or models, eg number lines
	3	Bridging to ten to subtract a 1-digit number from a 2-digit number using models and diagrams	• subtract to the nearest ten first then subtract the rest, using models for support, eg 32 - 6 as 32 - 2 = 30 and 30 - 4 = 26 • record the strategy of bridging to ten using numbers and/or models eg number lines
	4	Bridging to ten to mentally add or subtract a 1-digit and 2-digit number	• use bridging to ten to solve addition and subtraction problems with 1- and 2-digit numbers • use bridging to ten to solve addition and subtraction problems with 1- and 2-digit numbers where the change is unknown, eg 25 + ? = 32
Add using place value up to 100	1	Adding 2-digit and 1-digit numbers using place value partitioning with models (split strategy)	• model and solve the addition of a 2-digit and 1-digit number using place value equipment, eg use base 10 blocks to show 25 + 8 as 20 + 5 + 8 and then 20 + 13 = 33
	2	Adding 2-digit and 1-digit numbers using place value understanding (split strategy)	• mentally solve the addition of a 2-digit and 1-digit number using place value partitioning
Solve addition and subtraction word problems	1	Creating and solving simple addition and subtraction word problems in context (within 20)	• represent a word problem as an addition or subtraction number sentence • solve a variety of simple addition and subtraction word problems in context, eg find the difference, find the sum, change unknown, start unknown simple addition and subtraction word problems
Explore equality and inequality up to 10 and 20	1	Exploring equality and inequality (up to 10)	• create a set in which the number of objects is greater than, less than or equal to the number of objects in a given set • determine if 2 given concrete sets are equal or unequal and explain the process used
	2	Exploring equality and inequality (up to 20)	• create a set in which the number of objects is greater than, less than or equal to the number of objects in a given set • determine if 2 given concrete sets are equal or unequal and explain the process used
	3	Recognising equality in addition and subtraction number sentences using objects and models for support	• determine if equations involving addition or subtraction are true or false, eg 6 = 6, 7 = 8 - 1, 5 + 2 = 2

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Number and Algebra

Learning Journey	Steps	Spine Nodes	Subnodes
Represent practical situations that model sharing (VCMNA090)			
Quest: Division – sharing			
Share objects to divide	1	Sharing objects to divide up to 20	• share a collection of objects equally into a given number of groups using concrete materials, models or drawings, eg '15 balloons shared by 3 children, how many balloons will they each get?' • relate to multiplication by recombining the groups, eg by counting or skip counting to check the total number of objects • solve simple division problems by sharing into equal groups • explain how to share a group of objects to divide and describe the number of groups and the number in each group using stem sentences;- when sharing into 2 groups students may refer to one group as being 'one half'
	2	Sharing objects to divide (with leftovers) up to 20	• share a collection of objects equally into a given number of groups using concrete materials, models or drawings;- recognise that there are 'leftovers' • describe the part left over when a collection cannot be shared equally • describe the number of groups and the number in each group
Recognise and describe one-half as one of two equal parts of a whole (VCMNA091)			
Quest: Fractions and decimals			
Find half of a set or quantity (no symbols)	1	Finding half of a set or quantity (no symbols)	• find half of a set using equal sharing • find halves of quantities (up to 10) • find the whole from a half
Find half of a set or quantity (symbols)	1	Finding half of a set or quantity (symbols used)	• find half of a set using equal sharing • find halves of quantities (up to 10) • find the whole from one half • use the symbols to represent the fraction 1/2
Investigate and describe number patterns formed by skip counting and patterns with objects (VCMNA093)			
Quest: Patterns and algebra			
Explore repeating numeric patterns	1	Identifying, extending and describing repeating numeric patterns	• identify and extend through investigation, numeric repeating patterns, eg 1, 2, 1, 2, 1, 2, • describe numeric repeating patterns in a hundreds chart
Explore repeating patterns with objects	1	Recognising and describing repeating patterns with objects and symbols	• recognise and describe repeating patterns using objects and symbols;- recognise and correct errors in patterns
	2	Copying repeating patterns using objects and symbols	• copy repeating patterns using objects and symbols
	3	Continuing repeating patterns with objects and symbols	• continue repeating patterns using objects and symbols

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Number and Algebra

Investigate and describe number patterns formed by skip counting and patterns with objects (VCMNA093)			
Quest: Patterns and algebra			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Relate number and object patterns	1	Relating patterns with objects and symbols to number patterns	• describe and relate a pattern to the corresponding number pattern, eg circle, square, circle, square ... is a 'two pattern' • skip count to count the total objects in a pattern, eg count the total number of objects in a 'two pattern' by skip counting the groups of objects in 2s
Explore number patterns (1, 2, 5, 10)	1	Exploring skip counting patterns with multiples of 1s, 2s, 5s and 10s using concrete materials	• identify and describe patterns when skip counting forwards or backwards by 1s, 2s, 5s and 10s from any starting point, eg 'all these numbers end in five or zero' • investigate and solve problems based on number patterns
	2	Representing and describing number patterns (2s, 5s or 10s)	• represent number patterns (skip counting in multiples of 1s, 2s, 5s or 10s from any number) on a number line or number chart • describe the number pattern represented, eg 'this number pattern goes up in 5s'
Additive and subtractive patterns (within 5)	1	Recognising and describing additive and subtractive number patterns (within 5)	• recognise and describe given number patterns that increase or decrease, eg 'the numbers are going up'
	2	Copying additive and subtractive number patterns (within 5)	• copy given number patterns that increase or decrease, eg 1, 2, 3, 4, ... 20, 18, 16, 14, ...
	3	Extending additive and subtractive number patterns (within 5)	• continue given number patterns that increase or decrease, eg 1, 2, 3, 4, ... 20, 18, 16, 14, ...
Odd and even number patterns (up to 20)	1	Modelling odd and even number patterns up to 20	• model odd and even numbers using objects such as counters paired in 2 rows • describe the pattern created using the terms 'odd' or 'even' numbers
Recognise the importance of repetition of a process in solving problems (VCMNA094)			
Explore equality and inequality up to 10 and 20	1	Exploring equality and inequality (up to 10)	• create a set in which the number of objects is greater than, less than or equal to the number of objects in a given set • determine if 2 given concrete sets are equal or unequal and explain the process used
	2	Exploring equality and inequality (up to 20)	• create a set in which the number of objects is greater than, less than or equal to the number of objects in a given set • determine if 2 given concrete sets are equal or unequal and explain the process used • determine if equations involving addition or subtraction are true or false, eg 6 = 6, 7 = 8 - 1, 5 + 2 = 2

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Understanding Practice and Fluency (UPF)

Measurement and Geometry

Measure and compare the lengths, masses and capacities of pairs of objects using uniform informal units (VCMMG095)			
Quest: Length			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Explore informal units of length and distance	1	Exploring uniform informal units of length and distance	• identify appropriate uniform informal units to measure lengths and distances, eg paper clips instead of craft sticks to measure a pencil;- explain the relationship between the size of a unit and the number of units needed, eg more paper clips than craft sticks will be needed to measure the length of the desk • record lengths using informal units, eg the pencil is __ units long • recognise the need for uniform units and the need to place the units end-to-end without gaps or overlaps
	2	Measuring length using unit iteration	• record lengths and distances by referring to the number and type of uniform informal unit used
	3	Measuring lengths and distances with uniform informal units	• identify the length of an object or shape • record lengths and distances by referring to the number and type of uniform informal unit used
Quest: Volume and capacity			
Explore volume and capacity using informal units	1	Describing volume and capacities	• use the terms 'full', 'empty' and 'about half-full', 'quarter full', 'more than', 'less than' to describe the amount of substance in a container
	2	Exploring and explaining volume and capacity with uniform informal units	• use uniform informal units to measure the volume of containers;- pack cubic units (eg blocks) into rectangular containers so that there are no gaps • recognise and select appropriate uniform informal units to measure the volume/capacity of containers, eg using cups rather than teaspoons to fill a bucket • explain the relationship between the size of a unit and the number of units needed, eg more cups than ice cream containers will be needed to fill a bucket
Measure volume and capacity (informal units)	1	Estimating, measuring and recording volume and capacity with informal units	• record volumes/capacities by referring to the number and type of uniform informal unit used
Quest: Mass			
Measure volume and capacity (informal units)	1	Comparing and describing mass of 2 objects using a pan balance	• establish meaning of a 'level balance' and describe the 2 objects as having 'equal mass/weight' • describe the results of imbalance of a pan balance using the terms 'heavier' and 'lighter'
		Ordering more than 2 objects by mass using a pan balance	• order more than 2 objects by mass using a pan balance

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Understanding Practice and Fluency (UPF)

Measurement and Geometry

Learning Journey	Steps	Spine Nodes	Subnodes
Tell time to the half-hour (VCMMG096)			
Quest: Time – telling the time			
Tell time to the hour and half hour (analogue)	1	Telling time to the hour and half hour (analogue)	• observe and describe the coordinated movements of the hands on an analogue clock as time progresses in half-hour intervals • describe the position or draw of the hands of an analogue clock when reading time to the half hour • read time on analogue clocks to the half hour using the terms 'o'clock' and 'half past' • position or draw the hands on an analogue clock to show time to the half-hour where the time is given using the terms 'o'clock' or 'half-past' • relate hour and half hour times and the duration of a half hour to everyday events;- develop a personal reference for a half hour
Tell time to the hour and half hour (digital)	1	Telling time to the hour and half hour (digital)	• read time on 12-hour digital clocks to the half-hour using the terms 'o'clock' and 'half past' • connect 12-hour digital displays for times to the half-hour to their corresponding display on an analogue clock • record times on analogue clocks to the half-hour in 12-hour digital format • relate hour and half hour times and the duration of a half hour to everyday events;- develop a personal reference for a half hour
Describe duration using months, weeks, days and hours (VCMMG097)			
Quest: Time – describe duration			
Describing duration (hours)	1	Introducing formal units for time: hours	• identify situations where hours are an appropriate unit for measuring the duration of time • identify the relationship between half hours and hours • compare durations in hours
Recognise and classify familiar two-dimensional shapes and three-dimensional objects using obvious features (VCMMG098)			
Quest: Two-dimensional shapes			
Sort quadrilaterals from other 2D shapes	1	Introducing quadrilaterals	• recognise all regular and irregular closed 4-sided shapes as quadrilaterals • sort quadrilaterals from other two-dimensional shapes
Identify, sort and name octagons	1	Introducing octagons	• identify, sort and name octagons in different orientations, including octagons in their environment
Identify, sort and name pentagons	1	Introducing pentagons	• identify, sort and name pentagons in different orientations, including pentagons in their environment
Identify, sort and name hexagons	1	Introducing hexagons	• identify, sort and name hexagons in different orientations, including hexagons in their environment

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Understanding Practice and Fluency (UPF)

Measurement and Geometry

Recognise and classify familiar two-dimensional shapes and three-dimensional objects using obvious features (VCMMG098)			
Quest: Two-dimensional shapes			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Identify and name simple 2D shapes	1	Identifying and naming two-dimensional shapes	• identify and name two-dimensional shapes including octagons, pentagons, circles, hexagons, triangles and quadrilaterals by their number of sides • select a shape from a description of its features, eg number of sides or vertices • identify and name shapes in pictures, designs and the environment
	2	Identifying and naming shapes embedded in pictures, designs and the environment	• Identify shapes embedded in pictures
Compare, describe and sort simple 2D shapes	1	Comparing and describing two-dimensional shapes	• manipulate, compare and describe similarities and differences between two-dimensional shapes including octagons, pentagons, circles, hexagons, triangles and quadrilaterals • identify and describe the number of sides
	2	Sorting two-dimensional shapes	• sort regular and irregular two-dimensional shapes in various orientations including octagons, pentagons, circles, hexagons, triangles, quadrilaterals using a given attribute, eg number of sides or vertices
Identify vertical and horizontal lines	1	Introducing vertical and horizontal lines	• identify and name vertical and horizontal lines in pictures and the environment
Identify parallel lines	1	Introducing parallel lines	• identify and name parallel lines in pictures and the environment • recognise that parallel lines can occur in orientations other than vertical and horizontal
Quest: Three-dimensional objects			
Explore surfaces and faces	1	Introducing surfaces	• manipulate three-dimensional objects and identify the type and number of flat and curved surfaces, eg 'The prism has eight flat surfaces' • sort three-dimensional objects by the type and number of flat and curved surfaces
	2	Introducing faces	• identify and describe the number and shape of faces on a cube, rectangular prism or triangular prism • select a three-dimensional object from a description of its faces, eg '6 square faces'
Recognise and describe spheres	1	Introducing spheres	• recognise spheres in the environment and drawings • select spheres from other three-dimensional objects using a description, 'round and rolls';- name the shape
Recognise and describe cones	1	Introducing cones	• recognise cones in the environment and drawings, including different orientations • manipulate and describe cones as having 1 flat surface and 1 curved surface • select cones from other three-dimensional objects using a description, '1 flat surface and 1 curved surface';- name the shape

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Understanding Practice and Fluency (UPF)

Measurement and Geometry

Recognise and classify familiar two-dimensional shapes and three-dimensional objects using obvious features (VCMMG098)			
Quest: Three-dimensional objects			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Recognise and describe cubes	1	Introducing cubes	• recognise cubes in the environment and drawings, including different orientations • select cubes from other three-dimensional objects using a description, eg '6 square faces';- name the shape
Recognise and describe cylinders	1	Introducing cylinders	• recognise cylinders in the environment and drawings, including different orientations • manipulate and describe cylinders as having 2 flat surfaces and 1 curved surface • select cylinders from other three-dimensional objects using a description, eg '2 flat surfaces and 1 curved surface', name the shape
Recognise, sort and name 3D objects	1	Recognising and naming three-dimensional objects	• recognise common three-dimensional shapes in the environment and drawings, including different orientations • name common three-dimensional shapes
	2	Sorting familiar three-dimensional objects — cones, cubes, spheres, cylinders, prisms	• sort familiar three-dimensional objects using given attributes
	3	Comparing three-dimensional objects to everyday objects	• identify common three-dimensional objects in everyday objects, eg cans, balls, boxes
Recognise and describe prisms (no formal names)	1	Introducing prisms	• recognise prisms in the environment and drawings, including different orientations • manipulate and describe prisms as having identical bases and rectangular faces • select prisms from other three-dimensional objects using a description, eg 'rectangular faces';- name the shape (as prism only)
Give and follow directions to familiar locations (VCMMG099)			
Position using left, right and ordinal numbers	1	Describing position using more than 1 descriptor	• describe the location of objects in a given structure using more than 1 descriptor, including 'from the left' and 'from the right' and ordinal number words • locate objects in a given structure given a description involving more than 1 descriptor, including 'from the left' and 'from the right' and ordinal number words
	2	Establishing and understanding left and right from opposite direction	• describe the position of an object as to the left or right of a person facing in the same direction as themselves • describe the position of an object as to the left or right of a person facing in the opposite direction to themselves
	3	Following given directions	• follow directions to position an object in a structure or picture
	4	Describing the path from one location to another on drawings.	• Use a diagram to give simple directions. • Create a path from one location to another.

Victorian Curriculum Year 1

Understanding Practice and Fluency (UPF)

Statistics and Probability

Identify outcomes of familiar events involving chance and describe them using everyday language, such as 'will happen', 'won't happen' or 'might happen' (VCMSP100)			
Quest: Data			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Use the everyday language of chance	1	Exploring possible outcomes of familiar events and activities	• use everyday language to describe the possible outcomes of familiar activities and events, eg 'will happen', 'might/could happen', 'won't happen', 'probably'
Choose simple questions and gather responses and make simple inferences (VCMSP101)			
Ask suitable questions for data collection	1	Asking questions and collecting simple data with support	• choose a suitable question for a given matter of interest involving category data, eg 'How did the children in Room 3 come to school?'
Complete tally charts	1	Introducing and completing tally charts	• collect and sort data using a simple given tally chart
Represent data with objects and drawings where one object or drawing represents one data value and describe the displays (VCMSP102)			
Represent data in a simple display	1	Representing category or discrete data using simple displays	• use concrete materials or pictures of objects as symbols to create data displays where 1 object or picture represents 1 data value (one-to-one correspondence), eg use different-coloured blocks to represent different-coloured cars • record data in prepared graphic organisers such as simple block charts, pictograms or other diagrams
Read simple data displays using objects	1	Interpreting basic data displays including tally charts, tables and data displays with concrete materials	• describe information presented in tables, lists or other simple data displays using comparative language such as 'more than' and 'less than', eg 'There were more black cars than red cars'

Victorian Curriculum Year 2

Understanding Practice and Fluency (UPF)

Number and Algebra

Investigate number sequences, initially those increasing and decreasing by twos, threes, fives and tens from any starting point, then moving to other sequences (VCMNA103)			
Quest: Whole number – counting			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Count in ones up to 1000	1	Counting forwards in ones within 1000	• count forwards in ones between 100 and 1000, starting from any number • identify missing numbers in the hundreds on a number line up to 1000
	2	Counting backwards in ones within 1000	• count backwards in ones between 100 and 1000, starting from any number • identify missing numbers in the hundreds on a number line up to 1000
	3	Counting forwards and backwards in ones within 1000	• count forwards and backwards in ones between 100 and 1000, starting from any number • identify missing numbers in the hundreds on a number line up to 1000
Identify numbers before and after up to 1000	1	Identifying numbers before and after within 1000	• identify the number that comes before a given 3-digit number up to 1000;- describe this number as 'one more than' • identify the number that comes after a given 3-digit number up to 1000;- describe this numbers as 'one less than' • identify the number that comes before or after a given 3-digit number up to 1000;- describe this number as 'one more than' or 'one less than'
Quest: Whole number – sequences			
Identify, describe and continue number sequences	1	Identifying and describing number patterns (1s, 2s, 5s, 10s, 25s) up to 100	• identify and describe growing and shrinking patterns generated by the repeated addition or subtraction of 1s, 2s, 5s, 10s or 25s on a number line or number chart
	2	Counting forwards and backwards by 2s, 3s and 5s from any starting point	• count forwards and backwards by 2s from any starting point • count forwards and backwards by 5s from any starting point • count forwards and backwards by 3s from any starting point • identify sequences in 2s, 3s, or 5s in a number chart
Count in tens with 2- and 3-digit numbers	1	Counting in tens with 2-digit numbers, on the decade, using number lines and charts	• count forwards and backwards in tens, on the decade, with 2-digit numbers using number lines • count forwards and backwards in tens, on the decade, with 2-digit numbers using number charts
	2	Counting in tens with 3-digit numbers using number lines and charts	• count forwards and backwards in tens, on the decade, with 3-digit numbers using number lines and number charts • count forwards and backwards in tens, on the decade, with 3-digit numbers using number charts
	3	Counting in tens from any number with 2-digit numbers	• count forwards and backwards in tens, off the decade, with 2-digit numbers using number lines • count forwards and backwards in tens, off the decade, with 2-digit numbers using number charts
	4	Counting in tens from any number with 3-digit numbers	• count forwards and backwards in tens, off the decade, with 3-digit numbers using number lines • count forwards and backwards in tens, off the decade, with 3-digit numbers using number charts

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Understanding Practice and Fluency (UPF)

Number and Algebra

Learning Journey	Steps	Spine Nodes	Subnodes
Investigate number sequences, initially those increasing and decreasing by twos, threes, fives and tens from any starting point, then moving to other sequences (VCMNA103)			
Quest: Whole number – sequences			
Find numbers 10 before and 10 after up to 1000	1	Finding numbers 10 before and 10 after a 2-digit number on the decade	• find the number '10 before' or '10 after' a given 2-digit on the decade number using number lines and number charts
	2	Finding numbers 10 before and 10 after a 2-digit and 3-digit number off the decade	• find the number '10 before' or '10 after' a given 2-digit or 3-digit number off the decade, using number lines and number charts
Recognise, model, represent and order numbers to at least 1000 (VCMNA104)			
Quest: Whole number – place value			
Read and represent 3-digit numbers	1	Reading and writing 3-digit numbers using numeral only	• read a given 3-digit number in words, eg 456 says 'four hundred and fifty-six'
	2	Reading and writing 3-digit numbers using words and numerals	• write a given 3-digit number in words, eg 456 as four hundred and fifty-six • write the numerals for a 3-digit number given in words
	3	Representing 3-digit numbers using words, numerals and objects	• model a given 3-digit number using concrete materials, pictures or drawings • write the numerals and words, eg 'two hundred and fifty-three' for a 3-digit number represented using place value equipment or using pictures and drawings
Compare and order numbers to 1000	1	Comparing numbers to 1000	• model and compare two 3-digit numbers using place value equipment • compare two 3-digit numerals;- describe as 'more than' or 'less than', 'smaller than', greater than'
	2	Ordering numbers to 1000	• order up to 4 consecutive numbers within 1000 in ascending order or descending order;- explain the reason for the order given • order up to 4 non-consecutive numbers within 1000 in ascending order;- explain the reason for the order given
Group, partition and rearrange collections of up to 1000 in hundreds, tens and ones to facilitate more efficient counting (VCMNA105)			
Quest: Whole number – partition and group			
Identify place value in 3-digit numbers	1	Identifying the place value of digits in 3-digit numbers	• write the numeral for a 3-digit number modelled using place value equipment • identify the digit in the hundreds, tens or ones column for a given 3-digit number • recognise that the value of the digit is determined by its place value, eg in 689 the digit 8 has a place value of tens and a total value of 80 • identify, record and model a number using place value clues, eg 'a 5 in the hundreds and a 2 in the ones' as 502 • recognise the role of zero as a placeholder • create the smallest and largest numbers possible using 3 digits

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Number and Algebra

Group, partition and rearrange collections of up to 1000 in hundreds, tens and ones to facilitate more efficient counting (VCMNA105)			
Quest: Whole number – partition and group			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Count in hundreds, tens and ones	1	Counting in hundreds, tens and ones	• count in hundreds, tens and then ones along a partially labelled number line to place a number between 100 and 1000 • use clues to identify a number between 100 and 1000 on a number line, eg 3 hundreds, 5 tens and 7 ones as 357 • count in hundreds, tens and ones on a partially labelled number chart to position a number between 100 and 1000
Partition 3-digit numbers (standard)	1	Using place value to partition 3-digit numbers	• use place value equipment to partition a given 3-digit number into hundreds, tens and ones • describe a 3-digit number using words, eg 523 as '5 hundreds, 2 tens and 3 ones' • write a 3-digit number in expanded notation, eg 523 as 500 + 20 + 3 • write the numeral for a number represented by expanded notation • recognise zero as a placeholder
Partition 3-digit numbers (non-standard)	1	Partitioning 3-digit numbers using non-standard partitioning	• use place value equipment to partition a given 3-digit number using non-standard partitioning, eg 375 as 2 hundreds and 175 ones or 200 + 175 • model and identify a number from non-standard partitioning, eg recognise 3 hundreds, 4 tens and 27 ones or 300 + 40 + 27 as 367
Round numbers up to 1000 to the nearest 100	1	Rounding numbers up to 1000 to the nearest 100	• model a 3-digit number and recognise which hundred it is nearer to;- explain reasoning • round a 3-digit number to the nearest 100, recognise the digit in the tens column as the key digit
Count and order small collections of Australian coins according to their value (VCMNA111)			
Quest: Whole number – money			
Count and order Australian notes and coins	1	Recognising notes and coins | Australia	• recognise the value of all Australian coins and notes • recognise that there are 100 cents in 1 dollar • recognise and generate combinations of the same and different denominations of coins that make $1
	2	Counting totals using notes and coins of the same denomination| Australia	• determine the total amount of money by counting the value of notes of the same denomination
	3	Using notes and coins to make amounts | Australia	• combine amounts of notes and coins to make a given amount of money shown in dollars and cents (no decimal point)
	4	Calculating totals of notes and coins and record using symbols| Australia	• calculate the total value of a group of notes and coins and record this value in dollars and cents using the correct symbols (no decimal point)
	5	Recognising that the same value can be created using different combinations of coins | Australia	• generate and recognise different combinations of coins that have the same value (combining coins of the same denominations and different denominations) and record these using the symbol c
		Recognising that the same value can be created using different combinations of notes | Australia	• generate and recognise different combinations of notes that have the same value (combining notes of the same denominations and different denominations) and record these using the symbol $

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Understanding Practice and Fluency (UPF)

Number and Algebra

Explore the connection between addition and subtraction (VCMNA106)			
Quest: Addition and subtraction			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Find fact families for additon and subtraction	1	Finding fact families for addition and subtraction (between 10 and 20)	• find the other three facts given one fact, eg 12 + 5 = 17 • find the other three facts given one fact, eg 12 + 5 = 17
Solve simple addition and subtraction problems using a range of efficient mental and written strategies (VCMNA107)			
Use mental strategies to add and subtract (to 100)	1	Adding with 1 digit to/from 2-digit numbers using efficient mental strategies (max sum 100)	• select, use and record an efficient strategy to solve an addition problem, eg counting on, bridging to ten, split strategy, jump strategy, place value
	2	Subtracting with 1 digit to/ from 2-digit numbers using efficient strategies	• select, use and record an efficient strategy to solve the subtraction of a 1-digit number from a 2-digit number, eg counting back, bridging to ten, inverse relationship with addition, jump strategy (max sum 100)
	3	Adding and subtracting 1 digit to/from 2-digit numbers using efficient strategies (max sum 100)	• select, use and record an efficient strategy to solve an addition or subtraction problem (max sum 100)
Add and subtract tens from a 2-digit number	1	Adding tens to a 2-digit number using models and/or equipment for support	• add ten and multiples of ten to a give 2-digit number, eg 36 + 20 = 56 (max sum 100)
	2	Subtracting tens from a 2-digit number using models and/or equipment for support	• subtract ten and multiples of ten to a give 2-digit number, eg 36 - 20 = 16 (max sum 100)
Introduce place value to add and subtract (to 200)	1	Introducing the addition of two 2-digit numbers using place value partitioning on a number line (jump strategy)	• use an empty number line to model and solve the addition of two 2-digit numbers, eg solve 35 + 43 as 35 + 10 + 10 + 10 + 10 = 75 then 75 + 1 + 1 + 1 = 78 (max sum 100)
	2	Introducing subtraction of two 2-digit numbers using place value partitioning on a number line (jump strategy)	• use an empty number line to model and solve the subtraction of two 2-digit numbers by counting back, eg solve 52 ? 23 as 52 ? 10 ? 10 = 32 then 32 ? 1 ? 1 ? 1 = 29 (max sum 100)
	3	Introducing the mental addition and subtraction of two 2-digit numbers using place value understanding (jump strategy)	• mentally solve the addition or subtraction of two 2-digit numbers using place value partitioning (max sum 100)
Use place value to add and subtract (to 200)	1	Adding two 2-digit numbers using place value partitioning on a number line (jump strategy)	• use an empty number line to model and solve the addition of two 2-digit numbers, eg solve 35 + 43 as 35 + 40 = 75 then 75 + 3 = 78
	2	Subtracting two 2-digit numbers using place value partitioning on a number line (jump strategy)	• use an empty number line to model and solve the subtraction of two 2-digit numbers by counting back, eg solve 52 ? 23 as 52 ? 20 = 32 then 32 ? 3 = 29 (max sum 100)
	3	Adding tens and ones using place value equipment and a split strategy (no crossing tens)	• model and solve the addition of two 2-digit numbers represented horizontally using place value equipment (not crossing ten), eg use base 10 blocks to model 34 + 12 as 30 + 10 and 4 + 2 (max sum 100)
	4	Subtracting tens and ones using place value equipment and a split strategy (no crossing tens)	• model and solve the subtraction of two 2-digit numbers represented horizontally using place value equipment (not crossing ten), eg use base 10 blocks to model 34 ? 12 as 30 ? 10 and 4 ? 2

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Understanding Practice and Fluency (UPF)

Number and Algebra

Solve simple addition and subtraction problems using a range of efficient mental and written strategies (VCMNA107)			
Quest: Addition and subtraction			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Use place value (no models) to add and subtract	1	Adding and subtracting tens and ones mentally using place value understanding (no crossing tens)	• solve the addition or subtraction of two 2-digit numbers represented horizontally (no crossing ten) • check calculations by doing the inverse operation
	2	Adding and subtracting two 2-digit numbers mentally using place value understanding	• mentally solve the addition or subtraction of two 2-digit numbers using a jump strategy, eg solve 35 + 43 as 35 + 40 = 75 then 75 + 3 = 78 (max sum 100) • check calculations by doing the inverse operation
Use place value to add (crossing a 10)	1	Adding two 2-digit numbers using place value models (split strategy)	• use place value equipment to model and solve the addition of two 2-digit numbers using standard partitioning, eg 37 + 45 as 30 + 40 and 5 + 7
Subtract using addition	1	Subtracting two 2-digit numbers using addition	• recognise and model the inverse relationship between addition and subtraction • rearrange a subtraction problem into an addition problem with change unknown and then use an effective addition strategy to solve, eg using a jump strategy to solve 54 ? 38 as 38 + ? = 54 on a number line
Solve word problems with start or change unknown	1	Solving addition and subtraction word problems where either the start or the is change unknown (1-digit and 2-digit numbers)	• solve word problems where the start is unknown, eg 'Anna had some plums. Sam gave her 5 more. Now she has 13 plums. How many did she have to start with?' • solve word problems where the change is unknown, eg 'Anna has 5 plums. How many more does she need to have 13?' or 'Anna had 13 plums. She gave some to Sam. Now she has 7 plums. How many plums did she give to Sam?' • solve word problems involving comparisons, eg Anna has 13 plums. Sam has 7 plums. How many more plums does Anna have? or Anna has 7 more plums than Sam. Sam has 5 plums. How many plums does Anna have?
Add and subtract using rounding and compensating	1	Adding ten then compensating to add a single digit (7, 8 or 9) to a 1 or 2-digit number	• add ten first then subract to compensate using models for support, eg 6 + 9 as 6 + 10 = 16 then 16 -1 = 15 • record the strategy adding ten then compensating to add a single digit (7,8 or 9) using numbers and/or models, eg number lines
	2	Subtracting ten then compensating to subtract a single digit (7, 8 or 9) from a 2-digit number	• subtract ten first then add to compensate using models for support, eg 15 - 9 as 15 - 10 = 5 then 5 + 1 = 6 • record the strategy subtracting ten then compensating to subtract a single digit (7,8 o r9) using numbers and/or models, eg number lines

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Understanding Practice and Fluency (UPF)

Number and Algebra

Recognise and represent multiplication as repeated addition, groups and arrays (VCMNA108)			
Quest: Mult/div – models, repeated addition			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Use repeated addition to multiply	1	Using repeated addition to multiply	• recognise and describe the relationship between, eg 3 groups of 4 as 4 + 4 + 4 • use empty number lines and number charts to help solve multiplication problems using repeated addition (2s, 5s, 10s, 3s, 4s) • explore the use of repeated addition to count in practical situations • apply known facts, such as doubles, to repeated addition problems, eg 5 + 5 + 5 + 5 as 10 + 10
Explore arrays (no x symbol)	1	Introducing arrays and describing arrays (no x symbol)	• describe simple multiplication problems represented in arrays using '_ groups of _' and use 'rows' and 'columns' to describe the parts of the array • represent simple multiplication problems using arrays (concrete materials, pictures or diagrams) • recognise and describe practical examples of arrays, eg seedling trays, seating arrangements
Use the commutative property of multiplication	1	Introducing the commutative property of multiplication	• use concrete materials or drawings of groups or arrays to model the commutative property, eg 3 groups of 2 is the same as 2 groups of 3
Represent division as grouping into equal sets and solve simple problems using these representations (VCMNA109)			
Quest: Mult/div – equal groups			
Divide by sharing and grouping	1	Dividing by sharing (up to 50)	• model and solve division problems by equally sharing a collection into a given number of groups or number of columns/rows in an array • record answers to division problems using drawings, words and numerals;- complete stem sentences eg 'when _ is shared into _ equal groups there are _ in each group' • describe any parts left over when the collection is not able to be equally shared
	2	Dividing by grouping (up to 50)	• model and solve division problems sharing a collection of objects into groups of a given size, and by arranging it into rows or columns of a given size in an array, eg determine the number of columns in an array when 20 objects are arranged into rows of 4 • record answers to division problems using drawings, words and numerals;- complete stem sentences, eg 'when _ is shared into _ equal groups there are _ in each group' • describe an parts left over when the collection is not able to be equally shared
Solve simple multiplication problems (2,5,10x)	1	Solving simple multiplication and division problems using models and manipulatives (2x, 5x, 10x)	• Solving simple multiplication and division problems using models and manipulatives (2x, 5x, 10x) • record answers to multiplication and division problems using drawings, words and numerals, eg '2 rows of 5 is 10'

Victorian Curriculum Year 2

Understanding Practice and Fluency (UPF)

Number and Algebra

Recognise and interpret common uses of halves, quarters and eighths of shapes and collections (VCMNA110)			
Quest: Fractions and decimals			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Explore the meaning of fraction symbols	1	Understand the meaning of fraction symbols (no formal use of numerator or denominator)	• Recognise the top number tells how many parts are selected • recognise the bottom number tells how many parts the whole has been split into (the name of the fraction / size of the part) • recognise the larger denominator = smaller parts as the whole has been split into more pieces
Find quarters of sets or shapes (no symbols)	1	Introducing quarters of objects, sets or shapes (no symbols)	• recognise objects, shapes or set shared into 4 equal parts • recognise that the same shape or object can be shared into 4 equal parts in different ways • find the whole given quarter(s) • use language 'one quarter', 'two quarters' and so on;- use words to describe fractions of sets and quantities eg 'one quarter of 12 is 3'
	2	Find quarters by halving	• Find a quarter of a shape or region by halving and halving again • Find a quarter of a set by halving and having again, e.g. one quarter of 12 is 3, because 1/2 of 12 = 6 and 1/2 of 6 = 3
Find quarters of sets or shapes (symbols)	1	Introducing quarters of objects, sets or shapes (symbols used)	• recognise objects, shapes or set shared into 4 equal parts;- recognise that the same shape or object can be shared into 4 parts in different ways • find 1/4, 2/4 and 3/4 of objects, shapes, lengths or sets • find the whole given quarter(s) • use symbols to represent fractions: 1/4, 2/4, 3/4, 4/4 • record quarters of sets as a number sentence, eg 1/4 of 12 = 3
Find halves and quarters (no symbols)	1	Finding halves and quarters of objects, shapes or sets (no symbols)	• recognise equivalence • find halves and quarters of objects and shapes • find halves and quarters of sets • find the whole from a part • find halves and quarters of uneven partitioned shapes • use language 'one half', 'two halves', 'one quarter', 'two quarters' and so on
	2	Recognising equivalence between halves and quarters of objects, shapes or sets up to 1 (symbols used)	• relate halves and quarters and know that 1/2 is the same as 2/4 • know that there are 2 quarters in 1 half • show equivalent halves and quarters using concrete materials and models.
Find halves and quarters (symbols)	1	Finding halves and quarters of linear models or sets (symbols used)	• find halves and quarters of objects and shapes • find halves and quarters of sets • find the whole from a part • find halves and quarters of uneven partitioned shapes • use language 'one half', 'two halves', 'one quarter', 'two quarters' and so on • use symbols to represent fractions: 1/2, 2/2, 1/4, 2/4, 3/4, 4/4
	2	Recognising equivalence between halves and quarters of linear models or sets (symbols used)	• relate halves and quarters and know that 1/2 is the same as 2/4 • know that there are 2 quarters in 1 half • show equivalent halves and quarters using concrete materials and models.

Victorian Curriculum Year 2

Understanding Practice and Fluency (UPF)

Number and Algebra

Learning Journey	Steps	Spine Nodes	Subnodes
Recognise and interpret common uses of halves, quarters and eighths of shapes and collections (VCMNA110)			
Quest: Fractions and decimals			
Find eighths of objects or shapes	1	Introducing eighths of objects or shapes (no fractional notation)	• find eighths of objects and shapes • recognise equivalence with halves and quarters
	2	Introducing eighths of objects or shapes	• find eighths of objects and shapes • recognise equivalence with halves and quarters • use the language of 'one eighth', 'two eighths' and so forth along with standard fractional notation
Find halves, quarters and eighths of shapes	1	Finding halves, quarters and eighths of objects or shapes (no fractional notation)	• recognise equivalence • estimate the size of a fractional part before using, eg paper folding to check or estimate the size of the whole from the part • find the whole from a part • find halves, quarters and eighths of uneven partitioned shapes • recognise that the larger number of parts means that the parts are smaller
Describe patterns with numbers and identify missing elements (VCMNA112)			
Quest: Patterns and algebra			
Number patterns (1, 2, 5, 10, 25 up to 100)	1	Identifying and describing number patterns (1s, 2s, 5s, 10s, 25s) up to 100	• identify and describe growing and shrinking patterns generated by the repeated addition or subtraction of 1s, 2s, 5s, 10s or 25s on a number line or number chart
Add or subtract patterns (within 10) up to 100	1	Extending, completing and describing simple additive or subtractive number patterns with 1 operation (within 10) up to 100	• determine a missing number in a number pattern, eg 3, 7, 11, _, 19 • describe a number pattern in words, eg 'It goes up by 3s'
Solve problems by using number sentences for addition or subtraction (VCMNA113)			
Write simple number sentences	1	Finding the missing number to make an addition or subtraction number sentence true (up to 18)	• complete number sentences involving 1 operation of addition or subtraction by finding the missing number using a variety of tools, equipment and strategies, eg using guess and check, eg 5 + (box symbol) = 13 or 15 - (box symbol) = 9
	2	Writing number sentences to solve word problems (1-digit and 2-digit addition and subtraction)	• represent a word problem as an addition or subtraction number sentence
Apply repetition in arithmetic operations, including multiplication as repeated addition and division as repeated subtraction (VCMNA114)			
Use repeated subtraction to divide	1	Using repeated subtraction to divide	• solve division problems (group size known, number of groups unknown) using repeated subtraction and concrete materials, models or drawings of groups or arrays • use an empty number line or number chart to represent division problems as repeated subtraction (group size known ... number of groups unknown) • explore the use of repeated subtraction in practical situations

Victorian Curriculum Year 2

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Compare and order several shapes and objects based on length, area, volume and capacity using appropriate uniform informal units (VCMMG115)			
Quest: Length			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Compare and order lengths using informal units	1	Comparing and ordering the lengths of shapes and objects using uniform informal units	• identify the length of an object or shape • compare and order 2 or more shapes or objects that cannot be moved or aligned, according to their lengths, using an appropriate uniform informal unit
Quest: Area			
Compare and order areas (informal units)	1	Comparing and ordering areas using uniform informal units (indirect comparison)	• compare two areas by measuring using uniform informal units • order three or more areas by measuring using uniform informal units • make statements of comparison about the relative size of three areas, eg if A is larger than B and B is larger than C, then A is larger than C
Measure and estimate area using square units	1	Measuring and estimating areas of rectangles using a square unit	• establish usefulness of using a square unit to find an area as it allows for an array structure and does not have gaps or overlaps • compare the same area measured using different sized square unit • understand that the larger the unit square, the smaller the number of units needed and likewise the smaller the square unit, the larger the number of units needed
	2	Measuring and estimating areas of rectilinear shapes using a square unit	• establish usefulness of using a square unit to find an area as it allows for an array structure and does not have gaps or overlaps • compare the same area measured using different sized square unit • understand that the larger the unit square, the smaller the number of units needed and likewise the smaller the square unit, the larger the number of units needed
Compare and order volume using blocks	1	Comparing and ordering volumes of models made from blocks	• compare and order the volumes of 2 or more models by counting the number of blocks used in each model • recognise that models with different appearances may have the same volume
Compare and order volume using displacement	1		• compare and order the volumes of 2 or more objects by marking the change in water level when each is submerged
Compare the masses of objects using balance scales (VCMMG116)			
Quest: Compare the masses of objects using balance scales (VCMMG116)			
Compare and order mass using informal units	1		• find differences in mass by measuring and comparing, eg 'The pencil has a mass equal to 3 blocks and a pair of plastic scissors has a mass of 6 blocks, so the scissors are 3 blocks heavier than the pencil' • compare masses using simple multiples, eg twice and heavy, half as heavy

Victorian Curriculum Year 2

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Tell time to the quarter-hour using the language of 'past' and 'to' (VCMMG117)			
Quest: Time - telling the time			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Tell time to the half and quarter hour	1	Relating halves and quarters to telling time	• identify quarters and halves on a clock face • relate 'past' and 'to' to the halves of a clock face
	2	Telling time to the quarter hour (analogue)	• observe and describe the coordinated movements of the hands on an analogue clock as time progresses in quarter hour intervals • describe the position or draw of the hands of an analogue clock when reading time to the quarter hour • read time on analogue clocks to the quarter-hour using the terms 'o'clock', 'half past', 'quarter past' and 'quarter to' and relate to knowledge of fractions
	3	Telling time to the quarter hour (digital)	• read time on 12-hour digital clocks to the quarter-hour using the terms 'o'clock', 'half past', 'quarter past' and 'quarter to' • position or draw the hands on an analogue clock to show time to the quarter-hour where the time is given using the terms 'o'clock' or 'quarter-past' • record times on analogue clocks to the quarter-hour in 12-hour digital format • position or draw the hands on an analogue clock to show time to the quarter-hour where the time is given in 12-hour digital format
Name and order months and seasons (VCMMG118)			
Months of the year	1		• name and order the months of the year • determine the month before or after a given month
	2	Months of the year	• recall the number of days there are in each month
Know the seasons	1	Introducing the seasons	• know that there are 4 seasons in a year • name and order the seasons of the year • know and recall the months for each season • recognise that the seasons are opposite in the opposite hemisphere of the planet
Use a calendar to identify the date and determine the number of days in each month (VCMMG119)			
Quest: Time – using a calendar			
Use a calendar to identify the date	1	Introducing calendars	• identify elements of a conventional calendar (month, day, date) • identify a day and date using a conventional calendar • relate calendars to the parts of a written date
	2	Using a calendar to solve simple problems involving months	• locate any given month on a calendar • use a calendar to determine the number of months between events • use a calendar to determine which month comes before/after a given month
Use calendars to solve simple problems	1	Using calendars to solve problems	• locate any given date, including today's date, on a calendar • use a calendar to locate the date to match a given description, eg if today is Monday 8th April, then what is the date on Thursday?;- find the date of the third Thursday in March • use a calendar to determine the number of days, weeks or months until a future event or between events • use a calendar to calculate and describe lengths of time in days/ weeks

Victorian Curriculum Year 2

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Learning Journey	Steps	Spine Nodes	Subnodes
Describe and draw two-dimensional shapes, with and without the use of digital technologies (VCMMG120)			
Quest: Two-dimensional shapes			
Represent and describe regular polygons	1		• name two-dimensional shapes in different orientations, eg triangles, quadrilaterals, pentagons, hexagons octagons and describe the number of angles and/or sides • name two-dimensional shapes in different orientations, eg triangles, quadrilaterals, pentagons, hexagons octagons and describe the number of angles and/or sides
Describe the features of three-dimensional objects (VCMMG121)			
Quest: Three-dimensional objects			
Compare 2D shapes and 3D objects	1	Building three-dimensional structures	• describe the two-dimensional shapes that the structure contains
Identify faces, edges and vertices on 3D objects	1	Introducing edges on three-dimensional objects	• identify and count the edges on everyday objects and cones, cylinders, prisms, spheres and cubes
	2	Introducing vertices on three-dimensional objects	• identify and count the vertices on everyday objects and cones, cylinders, prisms, spheres and cubes
	3	Identifying faces, edges, vertices of cones, cubes, prisms, cylinders and spheres	• identify and count the faces, edges and vertices on everyday objects and cones, cylinders, prisms, spheres and cubes
Faces, edges, vertices and surfaces of 3D objects	1	Describing the attributes of cones, cubes, cylinders, spheres and prisms	• manipulate and describe the attributes of basic three-dimensional objects using attributes such as faces, edges, vertices, number and type of surfaces • select a three-dimensional object from a description, eg '6 faces, 12 edges and 8 vertices' • recognise that flat surfaces of three-dimensional objects are two-dimensional shapes and name the shapes of these surfaces
	2	Sorting three-dimensional objects (cubes, prisms, spheres, cylinders)	• sort three-dimensional objects according to particular attributes, eg the shape of the surfaces or number of edges
Investigate the effect of one-step slides and flips, with and without the use of digital technologies (VCMMG123)			
Quest: Transformation and position			
Translations of shapes (slides, flips, turns)	1	Introducing transformations: Slides (translations)	• identify and describe a one-step slide of a shape using the term 'slide'
	2	Introducing transformations: Flips (reflections)	• identify and describe a one-step flip of a shape using the term 'flip'
	3	Transformations of shapes: Flips and slides	• identify a one-step slide or flip of a single shape and use the terms 'slide' and 'flip' to describe the movement of the shape • identify a one-step slide or flip of a single shape and use the terms 'slide' and 'flip' to describe the movement of the shape • recognise that sliding or flipping a shape does not change its size or features • recognise that sliding or flipping a shape does not change its size or features

Victorian Curriculum Year 2

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Identify and describe half-turns and quarter-turns (VCMMG124)			
Quest: Transformation and position			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Translations of shapes (slides, flips, turns)	4	Introducing transformations of shapes: Turns (rotations)	• recognise and describe turns as 'clockwise' or 'anti-clockwise' • Identify and describe half-turns and quarter-turns • Identify and describe half-turns and quarter-turns
Interpret simple maps of familiar locations and identify the relative positions of key features (VCMMG122)			
Read simple maps	1	Interpreting simple maps	• interpret simple maps of familiar locations and describe the location of specific features relative to other features • describe, using landmarks and directional language, a path from 1 feature to another on a simple map
	2	Following pathways on simple maps	• follow and draw a path on a simple map given directions that use landmarks and directional language

Victorian Curriculum Year 2

Understanding Practice and Fluency (UPF)

Statistics and Probability

Learning Journey	Steps	Spine Nodes	Subnodes
Identify practical activities and everyday events that involve chance. Describe outcomes as 'likely' or 'unlikely' and identify some events as 'certain' or 'impossible' (VCMSP125)			
Quest: Chance			
Use basic probability language	1	Using the basic language of probability: impossible, possible, likely, unlikely	• Identify practical activities and everyday events that involve chance, eg 'I might play with my friend after school' • describe outcomes in everyday activities and events as being 'possible', 'impossible', 'likely' or 'unlikely' to happen
	2	Using the language of probability: possible and impossible	• identify and distinguish between 'possible' and 'impossible' events • describe familiar events as being 'possible' or 'impossible', eg 'It is possible that it will rain today', 'It is impossible to roll a standard six-sided die and get a 7'
	3	Using the language of probability: likely and unlikely	• describe possible outcomes in everyday activities and events as being 'likely' or 'unlikely' to happen • compare familiar activities and events and describe them as being 'likely' or 'unlikely' to happen
	4	Using the language of probability: certain and uncertain	• identify and distinguish between 'certain' and 'uncertain' events • describe familiar situations as being certain or uncertain, eg 'It is uncertain what the weather will be like tomorrow', 'It is certain that tomorrow is Saturday'
Identify a question of interest based on one categorical variable and gather data relevant to the question (VCMSP126)			
Quest: Data			
Answer questions related to simple data displays	1	Conducting a well-supported and basic statistical investigation using category data	• answer questions and make simple statements related to the data gathered
Create displays of data using lists, tables and picture graphs and interpret them (ACMSP050)			
Read and intepret simple picture graphs	1	Introducing and reading picture graphs (up to 4 categories)	• read and interpret data represented in a picture graph;- pose and answer simple summative and comparative questions, eg 'Which is the least favourite season?' • choose an appropriate title for a display;- labels the axis • identify misleading representations of data in a picture graph, eg where the symbol used to represent one item is shown in different sizes or where symbols are not equally spaced
	2	Representing and reading category data in a picture graph	• read and interpret data represented in a picture graph;- pose and answer simple summative and comparative questions, eg 'Which is the least favourite season?'
Read and intepret simple picture graphs	1	Representing and reading data displayed in tables or lists	• display category or numerical data using lists and tables • pose questions and answer one-step and two-step questions, eg 'How many more students like reading than art?';- identify basic similarities and differences between categories;- make simple conclusions
Use a tally chart, table, picture graph	1	Introducing the statistical investigation process (tables, lists or picture graphs)	• represent category data in a table, list or picture graph (one-to-one correspondence)

Victorian Curriculum Year 3

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

Learning Journey	Steps	Spine Nodes	Subnodes
VCMNA129 Investigate the conditions required for a number to be odd or even and identify odd and even numbers			
Quest: Odd and even numbers			
Exploring odd and even numbers	1	Investigating odd and even numbers	• model odd and even numbers of up to 2 digits using arrays with 2 rows • compare and describe the difference between models of even numbers and models of odd numbers • recognise the connection between even numbers and the multiplication facts for 2
	2	Identifying odd and even numbers	• recognise the significance of the final digit of a whole number in determining whether a given number is even or odd • identify even or odd numbers of up to 4 digits
	3	Identifying odd and even number patterns (add in number lines and number charts)	• model even and odd numbers of up to 20 using arrays with 2 rows • compare and describe the difference between the models of odd and even numbers • recognise the connection between even numbers, doubles and the 2 times-tables;- demonstrate the connection with words, models or numerals • use the final digit of a whole number to determine whether a given number is even or odd (up to four digits)
VCMNA130 Recognise, model, represent and order numbers to at least 10 000			
Quest: Numbers to 10 000			
Identifying and counting numbers to 4 digits	1	Identifying numbers before and after up to 4-digit numbers (within 10000)	• identify the number that comes before a given 2,-, 3- or 4-digit number up to 10000;- describe this number as 'one more than' • identify the number that comes after a given 2-, 3- or 4-digit number up to 10000;- describe this number as 'one less than' • identify the number that comes before or after a given 2-, 3- or 4-digit number up to 10000;- describe this number as 'one more than' or 'one less than'
	2	Counting by tens and hundreds using models, number lines and charts	• count forwards and backwards in tens, on and off the decade, with 2-digit, 3-digit and 4-digit numbers using number lines and number charts • count forwards and backwards in hundreds, on the decade, with 3-digit and 4-digit numbers using number lines and number charts • count forwards and backwards in hundreds, on and off the decade, with 3-digit and 4-digit numbers using number lines and number charts
	3	Counting by tens and hundreds	• count forwards and backwards in tens, on and off the decade, with 2-digit, 3-digit and 4-digit numbers • count forwards and backwards in hundreds, on the decade, with 3-digit and 4-digit numbers • count forwards and backwards in hundreds, on and off the decade, with 3-digit and 4-digit numbers
	4	Finding numbers 10 or 100 before and after up to 1000	• find the number '10 before' or '10 after' a given 2-digit, 3-digit or 4-digit number on or off the decade using number lines and number charts • find the number '100 before' or '100 after' a given 3-digit or 4-digit number on or off the decade using number lines and number charts

Victorian Curriculum Year 3

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA130 Recognise, model, represent and order numbers to at least 10 000			
Quest: Numbers to 10 000			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Reading and representing numbers: up to 4 digits	1	Reading and writing 4-digit numbers using words and numerals	• write a given 4-digit number in words, eg 4567 as four thousand, four hundred and sixty-seven • write the numerals for a 4-digit number given in words
	2	Representing 4-digit numbers using words, numerals and objects	• model a given 4-digit number using concrete materials, pictures or drawings • write the numerals in words, eg 'seven thousand, three hundred and fifty three' for a 4-digit number represented using place value equipment or using pictures, drawings
Comparing and ordering numbers to 10 000	1	Comparing numbers to 10000	• model and compare two 4-digit numbers using place value equipment • compare two numbers of up to 4 digits and describe using the terms and symbols: greater than (>) or less than (<);- explain the comparison using place value reasoning
	2	Ordering numbers to 10000	• order up to 4 consecutive 2-digit, 3-digit or 4-digit numbers within 1000 in ascending order or descending order;- explain the reason for the order given • order up to 4 non-consecutive 2-digit, 3-digit or 4-digit numbers within 1000 in ascending or descending order;- explain the reason for the order given using place value reasoning
VCMNA131 Apply place value to partition, rearrange and regroup numbers to at least 10 000 to assist calculations and solve problems			
Quest: Place value and partitioning			
Place value up to 4-digits	1	Using place value to partition 4-digit numbers	• use place value equipment to partition a given 4-digit number into thousands, hundreds, tens and ones • describe a 4-digit number using words, eg 9523 as '9 thousands, 5 hundreds, 2 tens and 3 ones' • write a 4-digit number in expanded notation, eg 7523 as 7000 + 500 + 20 + 3 • write the numeral for a number represented by expanded notation • recognise zero as a placeholder
	2	Identifying the place value of digits in 4-digit numbers	• write the numeral for a 4-digit number modelled using place value equipment • identify the digit in the thousands, hundreds, tens or ones column for a given 4-digit number • identify, record and model a number using place value clues, eg 'an 8 in the thousands, 5 in the hundreds and a 2 in the ones' as 8502 • recognise the role of zero as a placeholder • create the smallest and largest numbers possible using 4 digits
	3	Partitioning 4-digit numbers using non-standard partitioning	• use place value equipment to partition a given 4-digit number using non-standard partitioning, eg 2375 as 2 thousands, 1 hundred and 275 ones or 2000 + 100 + 275 • model and identify a number from non-standard partitioning, eg recognise 3 hundreds, 4 tens and 27 ones or 300 + 40 + 27 as 367

Victorian Curriculum Year 3

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

Learning Journey	Steps	Spine Nodes	Subnodes
VCMNA131 Apply place value to partition, rearrange and regroup numbers to at least 10 000 to assist calculations and solve problems			
Quest: Place value and partitioning			
Rounding numbers: 4 digits	1	Rounding numbers up to 10000 to the nearest 1000	• model a 4-digit number and recognise which thousand it is nearer to;- explain reasoning • round a 4-digit number to the nearest 1000;- recognise the digit in the hundreds column as the key digit
	2	Rounding numbers up to 10000 to the nearest 10, 100 or 1000	• round a 4-digit number to the nearest 10, 100 or 1000;- explain the rounding • apply an understanding of place value to read numbers up to 5 digits
VCMNA132 Recognise and explain the connection between addition and subtraction			
Quest: Addition and subtraction			
Relationship between addition and subtraction	1	Recognising and using the inverse relationship between addition and subtraction	• determine, through investigation, the inverse relationship between addition and subtraction • determine the missing number in addition and subtraction equations using a variety of tools and strategies, such as the inverse relationship between addition and subtraction (up to 2 digit with 2-digit addition or subtraction)
	2	Recognising equivalent number sentences with 1-digit and 2- digit numbers	• complete number sentences involving addition and subtraction by calculating missing numbers using a variety of tools and strategies • use inverse operations to complete number sentences • justify solutions when completing number sentences
	3	Judging the reasonableness of addition and subtraction answers (up to 3-digit answers)	• use benchmarks of 'more than or less than' to help judge the reasonableness of answers
VCMNA133 Recall addition facts for single-digit numbers and related subtraction facts to develop increasingly efficient mental strategies for computation			
Quest: Addition and subtraction facts and strategies			
Add/subtract: single digit numbers	1	Recalling number bonds to 30	• use known facts and number patterns to recall bonds to 30 eg 18 + 2 = 20 so 28 + 2 = 30
	2	Adding 3 or more single-digit numbers	• use appropriate strategies to add 3 or more single-digit numbers;- including changing the order, doubles if appropriate, bridging to a ten • explain and justify strategies used
	3	Adding and subtracting 3 or more single-digit numbers using compatible numbers	• use compatible numbers , eg 4 + 2 + 8 − 6 as 6 + 8 − 6 = 8
	4	Creating and solving addition and subtraction word problems (within 1000)	• represent a word problem as an addition or subtraction number sentence • solve simple addition and subtraction word problems in context including find the difference, find the sum, change unknown, start unknown • explain and compare strategies used to solve addition and subtraction word problems • create problems in contexts that involve addition and subtraction

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Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA133 Recall addition facts for single-digit numbers and related subtraction facts to develop increasingly efficient mental strategies for computation			
Quest: Addition and subtraction facts and strategies			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Add/subtract: 2 & 3-digit using jump strategy	1	Adding 2-digit and 3-digit numbers using place value partitioning on a number line (jump strategy)	• model and solve the addition of a 2-digit and 3-digit number using an empty number line, eg 823 + 56 as 823 + 50 = 873, 873 + 6 = 879
	2	Subtracting a 2-digit number from a 3-digit number using place value partitioning on a number line (jump strategy)	• model and solve the subtraction of a 2-digit number from a 3-digit number using an empty number line, eg 823 − 56 as 823 − 50 = 773, 773 − 6 = 767
	3	Adding and subtracting a 2-digit and 3-digit number using place value partitioning on a number line (jump strategy)	• model and solve the addition or subtraction of a 2-digit number from a 3-digit number using an empty number line, eg 823 − 56 as 823 − 50 = 773, 773 − 6 = 767
Add/subtract: 2- & 3-digit using place value	1	Adding 2-digit and 3-digit numbers mentally using place value understanding (jump strategy)	• mentally solve addition problems involving 2-digit and 3-digit numbers using a jump strategy, eg 823 + 56 as 823 + 50 = 873, 873 + 6 = 879 • record and explain the use of the strategy • check calculations using the inverse operation
	2	Subtracting a 2-digit number from a 3-digit number mentally using place value understanding (jump strategy)	• mentally solve subtraction problems involving 2-digit and 3- digit numbers using place value partitioning, eg 823 − 56 as 823 − 50 = 773, 773 − 6 = 767 • record and explain the use of the strategy • check calculations using the inverse operation
	3	Adding and subtracting a 2-digit and 3-digit number mentally using place value understanding (jump strategy)	• mentally solve addition and subtraction problems involving 2-digit and 3- digit numbers using place value partitioning, eg 823 − 56 as 823 − 50 = 773, 773 − 6 = 767
Add/subtract: 2- & 3-digit using bridging to 10	1	Bridging to ten to add two 2-digit numbers using models for support	• add to the nearest ten first then add the rest, using models for support, eg 28 + 17 as 28 + 2 = 30 and 30 + 15 = 45 • record and explain the use of the strategy
		Adding 2 numbers up to 3-digits using bridging to ten	• add up to two 3-digit numbers where the first number has a 7, 8, or 9 in the ones columns, by first adding to the nearest ten and then adding the rest, eg 368 + 25 as 368 + 2 + 23 • record and explain the strategy using numerals, models and/or diagrams
	2	Bridging to ten to subtract two 2-digit numbers using models for support	• subtract to the nearest ten first then subtract the rest using models for support, eg 33 − 18 as 33 − 3 − 10 − 5 • record and explain the use of the strategy
		Subtracting 2 numbers up to 3-digits using bridging to ten	• subtract two numbers (up to 3-digits) where the first number has a 1, 2 or 3 in the ones columns, by first subtracting to the nearest ten and then subtracting the rest, eg 362 − 25 as 362 − 2 − 23 • record and explain the strategy using numerals, models and/or diagrams

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Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA133 Recall addition facts for single-digit numbers and related subtraction facts to develop increasingly efficient mental strategies for computation			
Quest: Addition and subtraction facts and strategies			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Add/subtract: 2- & 3-digit using bridging to 10	3	Bridging to ten to mentally add and subtract two 2-digit numbers	• add or subtract to the nearest ten first then add or subtract the rest, using models for support, eg 28 + 17 as 28 + 2 = 30 and 30 + 15 = 45 • check calculations using the inverse operation
		Adding and subtracting 2 numbers up to 3-digits using bridging to ten	• add or subtract two numbers (up to 3-digits) where the first number has a 7, 8, or 9 in the ones columns, by first adding to the nearest ten and then adding the rest, eg 368 + 25 as 368 + 2 + 23, or 362 − 25 as 362 − 2 − 23 • record and explain the strategy using numerals, models and/or diagrams
Add/subtract: 2- & 3-digit using bridging to 10	7	Using a bridging strategy with start unknown or change unknown problems	• use a bridging strategy to solve addition and subtraction problems where the change is unknown, eg 29 + ? = 81 • use a bridging strategy to solve addition and subtraction problems where the start is unknown, eg ? + 29 = 81 becomes 29 + ? = 81
Add/subtract: 3-digits using partitioning	1	Adding two 3-digit numbers using place value partitioning on a number line (jump strategy)	• model and solve the addition of two 3-digit numbers using an empty number line, eg 823 + 356 as 823 + 300 = 1123, 1123 + 50 = 1173, 1173 + 6 = 1179
	2	Subtracting two 3-digit numbers using place value partitioning on a number line (jump strategy)	• model and solve the subtraction of two 3-digit numbers using an empty number line, eg 823 − 356 as 823 − 300 = 523, 523 − 50 = 473, 473 − 6 = 467
	3	Adding and subtracting two 3-digit numbers using place value partitioning on a number line (jump strategy)	• model and solve the addition or subtraction of two 3-digit numbers using an empty number line, eg 823 − 356 as 823 − 300 = 523, 523 − 50 = 473, 473 − 6 = 467
	4	Adding and subtracting multi-digit numbers using place value partitioning	• partition the second number to add two multi-digit numbers (up to 4 digits), eg 1546 + 625 as 546 + 600 + 20 + 5;- use standard or non-standard partitioning • partition the second number to subtract two multi-digit numbers (up to 4 digits), eg 1546 − 625 as 546 − 600 − 20 − 5;- use standard or non-standard partitioning
Add/subtract: 3-digits using place value	4	Adding up to 3-digit numbers mentally using place value understanding (jump strategy)	• solve the addition of two 3-digit numbers using a jump strategy, eg 823 + 356 as 823 + 300 = 1123, 1123 + 50 = 1173, 1173 + 6 = 1179 • explain and justify the use of the strategy
	5	Subtracting up to 3-digit numbers mentally using place value understanding (jump strategy)	• solve the subtraction of two 3-digit numbers using a jump strategy, eg 823 − 356 as 823 − 300 = 523, 523 − 50 = 473, 473 − 6 = 467 • explain and justify the use of the strategy
	6	Adding or subtracting up to 3-digit numbers mentally using place value understanding (jump strategy)	• solve the addition or subtraction of two 3-digit numbers using a jump strategy, eg 823 − 356 as 823 − 300 = 523, 523 - 50 = 473, 473 − 6 = 467

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Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA133 Recall addition facts for single-digit numbers and related subtraction facts to develop increasingly efficient mental strategies for computation			
Quest: Addition and subtraction facts and strategies			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Add/subtract: 2- & 3-digit using split strategy	1	Adding a 2-digit and 3-digit number using place value models (split strategy)	• model the addition of a 2-digit and 3-digit number using a split strategy with or without crossing tens;- use place value equipment, money or diagrams • solve addition problems using a split strategy, eg 265 + 27 as 260 + 20 and 5 + 7, 280 + 12 = 292 • record and explain the use of the strategy
		Adding up to two 3-digit numbers mentally using place value understanding (split strategy)	• solve addition problems using a split strategy, eg 265 + 327 as 200 + 300, 60 + 20 and 5 + 7, 500 + 80 + 12 = 592 • record and explain the strategy using numerals, models and/or diagrams
	2	Subtracting a 2-digit number from a 3-digit number using place value models (split strategy)	• model the subtraction of a 2-digit and 3-digit number using a split strategy;- place value equipment, money or diagrams • solve subtraction problems using a split strategy, eg 265 − 21 as 260 − 20 and 5 − 1, 240 + 4 = 244 • record and explain the use of the strategy
		Subtracting two 3-digit numbers mentally using place value understanding (split strategy)	• record and explain the strategy using numerals, models and/or diagrams • solve addition and subtraction problems using a split strategy, eg 265 + 327 as 200 + 300, 60 + 20 and 5 + 7, 500 + 80 + 12 = 592
	3	Adding and subtracting 2-digit and 3-digit numbers using place value models (split strategy)	• model the addition or subtraction of a 2-digit and 3-digit number using a split strategy;- place value equipment, money or diagrams • solve addition and subtraction problems using a split strategy, eg 265 − 21 as 260 − 20 and 5 − 1, 240 + 4 = 244 • record and explain the strategy using numerals, models and/or diagrams • check calculations using the inverse operation
		Adding and subtracting two 3-digit numbers mentally using place value understanding (split strategy)	• solve addition and subtraction problems using a split strategy, eg 265 + 327 as 200 + 300, 60 + 20 and 5 + 7, 500 + 80 + 12 = 592 • record and explain the strategy using numerals, models and/or diagrams • check calculations using the inverse operation
Add/subtract: rounding & compensation	1	Introducing addition using rounding and compensating with two 2-digit numbers	• add two 2-digit numbers where 1 number is close to a ten (digit in the ones column is 7, 8 or 9) • round 1 number to the next 10, carry out the addition and adjust the answer to compensate for the original rounding, eg 35 + 29 as 35 + 30 − 1 • record the strategy using numerals, models and/or diagrams and explain the need to compensate
		Adding up to two 3-digit numbers using rounding and compensating	• add up to two 3-digit numbers where 1 number is close to a hundred (ends in 97, 98 or 99) • round 1 number to the next 100, carry out the addition and adjust the answer to compensate for the original rounding, eg 398 + 23 as 400 + 23 − 2

Victorian Curriculum Year 3

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA133 Recall addition facts for single-digit numbers and related subtraction facts to develop increasingly efficient mental strategies for computation			
Quest: Addition and subtraction facts and strategies			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Add/subtract: rounding & compensation	2	Introducing subtraction using rounding and compensating with two 2-digit numbers	• subtract two 2-digit numbers where 1 number is close to a ten • round 1 number to the next 10, carry out the subtraction and adjust the answer to compensate for the original rounding, eg 33 − 19 as 33 − 20 + 1 or 81 − 35 as 80 − 35 + 1 • record the strategy using numerals, models and/or diagrams and explain the need to compensate
		Subtracting up to two 3-digit numbers using rounding and compensating	• record the strategy using numerals, models and/or diagrams and explain the need to compensate • subtract up to two 3-digit numbers where 1 number is close to a hundred (ends in 97, 98 or 99) • round 1 number to the next 100, carry out the subtraction and adjust the answer to compensate for the original rounding, eg 398 − 23 as 400 − 23 + 2 • record the strategy using numerals, models and/or diagrams and explain the need to compensate
	3	Introducing addition and subtraction using rounding and compensating with two 2-digit numbers	• add or subtract two 2-digit numbers where 1 number is close to a ten (digit in the ones column is 7, 8 or 9) • round 1 number to the next 10, carry out the addition or subtraction and adjust the answer to compensate for the original rounding, eg 33 − 19 as 33 − 20 + 1 or 81 − 35 as 80 − 35 + 1 • check calculations using the inverse operation
		Adding and subtracting up to two 3-digit numbers using rounding and compensating	• add or subtract up to two 3-digit numbers where 1 number is close to a hundred (ends in 97, 98 or 99) • round 1 number to the next 100, carry out the addition or subtraction and adjust the answer to compensate for the original rounding, eg 398 + 23 as 400 + 23 − 2 • use place value equipment to model pairs that add to 100, eg 63 and 37 • recognise that the ones make an extra ten when added
	4	Introducing addition using rounding and compensating when the change or start is unknown	• model with number lines and solve addition problems with two 2-digit numbers where the digits in the ones column for the known addend and result are close together, eg 23 + ? = 81 becomes 23 + 60 - 2 • explain and justify the use of the strategy
Add/subtract: to and from 100	1	Modelling pairs that add to 100	• use place value equipment to model pairs that add to 100, eg 63 and 37 • recognise that the ones make an extra ten when added
	2	Adding to make 100	• find pairs of numbers that add to 100 (multiples of 5), eg 45 and 55 • find pairs of numbers that add to 100, eg 42 and 58 • find the missing number to add to 100 when 1 number is given
	3	Subtracting from 100	• subtract 1 number from 100 (multiple of 5), eg 100 − 35 = 65 • subtract 1 number from 100, eg 100 − 29 = 71

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Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA133 Recall addition facts for single-digit numbers and related subtraction facts to develop increasingly efficient mental strategies for computation			
Quest: Addition and subtraction facts and strategies			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Add/subtract: multiples of 100, 1000 & 10000	1	Adding multiples of 100, 1000 and 10 000	• model the addition of hundreds and/or thousands using place value equipment or play money; relate these additions to adding ones, eg 4 + 3 = 7 so 4 thousands + 3 thousands = 7 thousands or 4000 + 3000 = 7000 • use known basic facts, eg 5 + 3 to add multiples of 100, 1000 or 10 000 using place value knowledge and pattern identification, eg 5 + 3 = 8, so 500 + 300 = 800, 5000 + 3000 = 8000 and 50 000 + 30 000 = 80 000
	2	Subtracting multiples of 100, 1000 and 10 000	• model the subtraction of hundreds and/or thousands using place value equipment or play money; relate these additions to subtracting ones, eg 8 − 3 = 5 so 8 thousands − 3 thousands = 5 thousands or 8000 − 3000 = 5000 • use known basic facts, eg 9 − 5 to subtract multiples of 100, 1000 or 10 000 using place value knowledge and pattern identification, eg 9 − 5 = 4, so 900 − 500 = 400, 9000 − 5000 = 4000 and 90 000 − 50 000 = 40 000
	3	Adding multiple single-digit numbers	• use the associative property of addition to make easier additions when possible, eg doubles or near doubles, pairs that add to a ten
Add/Subtract: using non-standard partitioning	1	Adding two 3-digit numbers using non-standard partitioning	• partition the second number using non-standard partitioning to add two 3-digit numbers, eg 1546 + 625 as 546 + 500 + 100 + 20 + 5 • record and explain the strategy using numerals, models and/or diagrams
	2	Subtracting two 3-digit numbers using non-standard partitioning	• partition the second number using non-standard partitioning to subtract two 3-digit numbers, eg 1546 − 625 as 546 − 500 − 100 − 20 − 5 • record and explain the strategy using numerals, models and/or diagrams
Add/Subtract: Choosing efficient strategies	1	Choosing efficient addition strategies when adding 2-digit and 3-digit numbers	• solve 2-digit and 3-digit addition problems using efficient and effective strategies depending on the numbers in the problem, eg use rounding and compensating, jump strategies, split strategies, place value strategies or bridging strategies • record and explain the strategy using numerals, models and/or diagrams • check the solution using a different strategy; compare with own and others' strategies, discuss and compare the efficiency of strategies
	2	Choosing efficient subtraction strategies when subtracting 2-digit and 3-digit numbers	• solve 2-digit and 3-digit subtraction problems using efficient and effective strategies depending on the numbers in the problem, eg use rounding and compensating, jump strategies, split strategies, place value strategies or bridging strategies • record and explain the strategy using numerals, models and/or diagram • check the solution using a different strategy; compare with own and others' strategies, discuss and compare the efficiency of strategies
	3	Choosing efficient addition and subtraction strategies when adding or subtracting 2-digit and 3-digit numbers	• solve 2-digit and 3-digit addition and subtraction problems using efficient and effective strategies depending on the numbers in the problem, eg use rounding and compensating, jump strategies, split strategies, place value strategies or bridging strategies • record and explain the strategy using numerals, models and/or diagrams • check the solution using a different strategy; compare with own and others' strategies, discuss and compare the efficiency of strategies

Victorian Curriculum Year 3

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA133 Recall addition facts for single-digit numbers and related subtraction facts to develop increasingly efficient mental strategies for computation			
Quest: Addition and subtraction facts and strategies			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Add/Subtract: Estimating	1	Estimating additions	• round numbers to the nearest multiple of 100 to estimate additions, eg 546 + 789 as 500 + 800 • round numbers to the nearest multiple of 10 or 100 to estimate additions, eg 546 + 789 as 540 + 800 • explain the reason for the estimation used and whether the estimation is higher or lower than the actual answer
	2	Estimating subtractions	• round numbers to the nearest multiple of 100 to estimate subtractions, eg 546 − 189 as 500 − 20 • round numbers to the nearest multiple of 10 or 100 to estimate subtractions, eg 746 − 389 as 740 − 400 • explain the reason for the estimation used and whether the estimation is higher or lower than the actual answer
VCMNA134 Recall multiplication facts of two, three, five and ten and related division facts			
Quest: Skip counting			
Skip counting by 10 to 1000	1	Counting by skip counting forwards by 10s from any multiple of 10 to 1000	• use concrete materials, models, drawings, number lines/charts to skip count forwards by 10s from any multiple of 10 up to 1000 skip count forwards by 10s from any multiple of 10 by memory and an understanding of the number sequence • recognise an error in the skip counting sequence
	2	Counting by skip counting backwards by 10s from any multiple of 10 up to 1000	• use concrete materials, models, drawings, number lines/charts to skip count backwards by 10s from any multiple of 10 up to 1000 • skip count backwards by 10s from any multiple of 10 by memory and an understanding of the number sequence • recognise an error in the skip counting sequence
	3	Counting by skip counting forwards or backwards by 10s from any multiple of 10 up to 1000	• use concrete materials, models, drawings, number lines/charts to skip count forwards or backwards by 10s from any multiple of 10 up to 1000 • skip count forwards or backwards by 10s from any multiple of 10 by memory and an understanding of the number sequence • recognise an error in the skip counting sequence
Skip counting by 2 to 1000	1	Counting by skip counting forwards by 2s from any multiple of 2 to 1000	• use concrete materials, models, drawings, number lines/charts to skip count forwards by 2s from any multiple of 2 up to 1000 • skip count forwards by 2s from any multiple of 2 by memory and an understanding of the number sequence • recognise an error in the skip counting sequence
	2	Counting by skip counting backwards by 2s from any multiple of 2 up to 1000	• use concrete materials, models, drawings, number lines/charts to skip count backwards by 2s from any multiple of 2 up to 1000 • skip count backwards by 2s from any multiple of 2 by memory and an understanding of the number sequence • recognise an error in the skip counting sequence

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Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA134 Recall multiplication facts of two, three, five and ten and related division facts			
Quest: Skip counting			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Skip counting by 5 to 1000	1	Counting by skip counting forwards by 5s from any multiple of 5 to 1000	• use concrete materials, models, drawings, number lines/charts to skip count forwards by 5s from any multiple of 5 up to 1000 • skip count forwards by 5s from any multiple of 5 by memory and an understanding of the number sequence • recognise an error in the skip counting sequence
	2	Counting by skip counting backwards by 5s from any multiple of 5 up to 1000	• use concrete materials, models, drawings, number lines/charts to skip count backwards by 5s from any multiple of 5 up to 1000 • skip count backwards by 5s from any multiple of 5 by memory and an understanding of the number sequence • recognise an error in the skip counting sequence
	3	Counting by skip counting forwards or backwards by 5s from any multiple of 5 up to 1000	• use concrete materials, models, drawings, number lines/charts to skip count forwards or backwards by 5s from any multiple of 5 up to 1000 • skip count forwards or backwards by 5s from any multiple of 5 by memory and an understanding of the number sequence • recognise an error in the skip counting sequence
Skip counting by 3 to 1000	1	Counting by skip counting forwards by 3s from zero up to 30	• use concrete materials, models, drawings, number lines/charts to skip count by 3s from zero • use rhythmic counting to count in 3s from zero • recognise an error in the skip counting sequence
	2	Counting by skip counting backwards by 3s from 30	• use concrete materials, models, drawings, number lines/charts to skip count backwards by 3s from 30 • use rhythmic counting to count backwards in 3s from 30 • recognise an error in the skip counting sequence
	3	Counting by skip counting forwards by 3s from any multiple of 3 up to 30	• use concrete materials, models, drawings, number lines/charts to skip count by 3s from any multiple of 3 • use knowledge of the number sequence to count in 3s from any multiple of 3 • recognise an error in the skip counting sequence
	4	Counting by skip counting backwards by 3s from any multiple of 3 from 30	• use concrete materials, models, drawings, number lines/charts to skip count backwards by 3s from 30 • use knowledge of the number sequence to count in backwards in 3s from any multiple of 3 • recognise an error in the skip counting sequence
	5	Counting by skip counting forwards or backwards by 3s from zero up to 30	• use concrete materials, models, drawings, number lines/charts to skip count by 3s • use rhythmic counting to count in 3s • recognise an error in the skip counting sequence
		Counting by skip counting forwards or backwards by 3s from any multiple of 3 from zero to 30	• use concrete materials, models, drawings, number lines/charts to skip count by 3s • use knowledge of the number sequence to count forwards or backwards in 3s from any multiple of 3 • recognise an error in the skip counting sequence
Skip counting by 4 to 40	1	Counting by skip counting forwards by 4s from zero up to 40	• use concrete materials, models, drawings, number lines/charts to skip count by 4s from zero • use rhythmic counting to count in 4s from zero • recognise an error in the skip counting sequence

Victorian Curriculum Year 3

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA134 Recall multiplication facts of two, three, five and ten and related division facts			
Quest: Multiplication & Division facts			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Multiplication/ Division facts for 2	1	Recalling multiplication facts for 2	• recall the 2 multiplication facts
	2	Using multiplication facts for 2	• solve and create multiplication problems in context (using multiplication facts for 2), including word problems
	3	Recalling the division facts for 2	• recall the division facts for 2
	4	Using division facts for 2	• solve and create division problems in context (using multiplication facts for 2), including word problems
	5	Multiplying and dividing by 2	• recall the multiplication and division facts for 2 • solve and create multiplication and division problems in context (using multiplication facts for 2), including word problems
Multiplication/ Division facts for 10	1	Recalling the multiplication facts for 10	• recall the 10 multiplication facts
	2	Using multiplication facts for 10	• solve and create multiplication problems in context (using multiplication facts for 10), including word problems
	3	Recalling the division facts for 10	• recall the division facts for 10
	4	Using division facts for 10	• solve and create division problems in context (using multiplication facts for 10), including word problems
	5	Multiplying and dividing by 10	• recall the multiplication and division facts for 10 • solve and create multiplication and division problems in context (using multiplication facts for 10), including word problems
Multiplication/ Division facts for 5	1	Recalling multiplication facts for 5	• recall the 5 multiplication facts
	2	Using multiplication facts for 5	• solve and create multiplication problems in context (using multiplication facts for 5), including word problems
	3	Recalling the division facts for 5	• recall the division facts for 5
	4	Using division facts for 5	• solve and create division problems in context (using multiplication facts for 5), including word problems
	5	Multiplying and dividing by 5	• recall the multiplication and division facts for 5 • solve and create multiplication and division problems in context (using multiplication facts for 5), including word problems
Multiplication/ Division facts for 2, 5, 10	1	Multiplying by 2s, 5s and 10s	• "* recall the multiplication facts for 2s, 5s and 10s * solve multiplication problems with 2, 5 or 10, including word problems; use the multiplication symbol"
	2	Dividing by 2s, 5s and 10s	• "* recall the division facts for 2s, 5s and 10s * solve division problems with 2, 5 or 10, including word problems; use the division symbol"
	3	Multiplying and dividing by 2s, 5s and 10s	• "* recall the multiplication facts and related division facts for 2s, 5s and 10s * solve multiplication and division problems with 2, 5 or 10, including word problems; use the multiplication symbol"

Victorian Curriculum Year 3

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA134 Recall multiplication facts of two, three, five and ten and related division facts			
Quest: Multiplication & Division facts			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Multiplication/ Division facts for 3	1	Exploring multiplication by 3	• relate multiplication by 3 to doubles and 1 more group; model and describe, eg '3 groups of 4 is the same as double 4 and one more group of 4' • explore patterns of the multiplication facts for 3 on a number chart • model the 2 related multiplication facts, eg 3 x 4 and 4 x 3
	2	Recalling multiplication facts for 3	• recall the multiplication facts for 3
		Using multiplication facts for 3	• solve and create multiplication problems in context (using multiplication facts for 3), including word problems
	3	Dividing by 3	• model and describe the related multiplication and division facts for 3 using models, drawings or manipulatives, eg 5 x 3 = 15 and 15 divided by 3 = 5 • relate division to how many (whole) times the divisor goes into the dividend
	4	Recalling the division facts for 3	• recall the division facts for 3
		Using division facts for 3	• solve and create division problems in context (using multiplication facts for 3), including word problems
	5	Multiplying and dividing by 3	• recall the multiplication facts and related division facts for 3 • solve multiplication and division problems with 3, including word problems
VCMNA135 Represent and solve problems involving multiplication using efficient mental and written strategies and appropriate digital technologies			
Quest: Multiplication word problems			
Writing & solving multiplication word problems	1	Writing and solving simple multiplication word problems (within 100)	• pose appropriate multiplication problems (up to 10 x 10) • solve multiplication word problems and explain using language, action, drawings, models • compare their own and others' methods of solution
	2	Solving multiplication problems using fair shares or equal grouping (within 100)	• solve fair share multiplication or division problems (with unknown in any position), eg '20 flowers are to be placed in 4 bunches, how many flowers will be in each bunch?' • solve equal grouping multiplication or division problems (with unknown in any position), eg 'There are 9 tables in a cafeteria. Each table has 5 chairs. What is the total number of chairs in the cafeteria?' • write equations using a symbol, eg a box or a blank, to represent the unknown number • compare their own and others' methods of solution
	3	Solving multiplication and division problems involving arrays (within 100)	• solve multiplication and division problems (with the unknown in any position) involving arrays, eg 'A rectangular egg carton has 3 rows and 4 columns of eggs. How many eggs are there?' • write equations using a symbol, eg a box or a blank, to represent the unknown number • compare their own and others' methods of solution

Victorian Curriculum Year 3

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA135 Represent and solve problems involving multiplication using efficient mental and written strategies and appropriate digital technologies			
Quest: Multiplication word problems			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Writing & solving multiplication word problems	4	Solving multiplication and division problems involving comparisons (within 100)	• solve multiplication and division problems involving comparisons eg 'Anna has 3 times as much money as David. David has $6. How much money does Anna have?' • write equations using a symbol, eg a box or a blank, to represent the unknown number • compare their own and others' methods of solution
Word problems and missing numbers	1	Finding the missing number to make a multiplication number sentence true (2, 5, 10 facts)	• complete number sentences involving 1 operation of multiplication by finding the missing number using a variety of tools, equipment and strategies, eg 3 x ? = 30 or ? X 2 = 18 or 5 x 3 = ?
	2	Finding the missing number to make a division number sentence true (2, 5, 10 facts)	• complete number sentences involving 1 operation of division by finding the missing numb using a variety of tools, equipment and strategies eg 40 ÷ 10 = ?, or 35 ÷ ? = 7 or ? ÷ 2 = 9
	3	Solving simple two-step word problems with addition and subtraction (max sum of 100)	• read and represent a two-step word problem using a letter for the unknown quantity • solve the problem using a variety of tools, models and strategies
	4	Solving two-step word problems with the four operations (2, 5, 10 multiplication facts)	• use the four operations to solve two-step word problems • represent an unknown quantity with a letter • solve the problem using a variety of tools, models and strategies

Fractions and decimals

VCMNA136 Model and represent unit fractions including 1/2, 1/4, 1/3, 1/5 and their multiples to a complete whole			
Quest: Fractions			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Using fractions: halves, quarters & eighths	1	Finding halves and quarters or objects, shapes or sets (symbols used)	• find halves and quarters of objects and shapes • find halves and quarters of sets • find the whole from a part • find halves and quarters of uneven partitioned shapes • use language 'one half', 'two halves', 'one quarter', 'two quarters' and so on • use symbols to represent fractions: 1/2, 2/2, 1/4, 2/4, 3/4, 4/4
	2	Counting up to 10 in halves and quarters (symbols used)	• count up to 10 from any starting point in halves and quarters • use the number line to count with halves and quarters
	3	Finding halves, quarters and eighths of objects or shapes	• recognise equivalence • estimate the size of a fractional part before using, eg paper folding to check or estimate the size of the whole from the part • find the whole from a part • find halves, quarters and eighths of uneven partitioned shapes • use symbols for halves, quarters and eighths • recognise larger denominator = smaller parts

Victorian Curriculum Year 3

Understanding Practice and Fluency (UPF)

Number and Algebra

Fractions and decimals

VCMNA136 Model and represent unit fractions including 1/2, 1/4, 1/3, 1/5 and their multiples to a complete whole			
Quest: Fractions			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Numerator and denominator	1	Introducing the terms numerator and denominator	• read and write symbols to represent fractions • use the terms denominator and numerator to describe a fraction
Using fractions: halves, thirds & quarters	1	Introducing thirds	• find thirds of objects, shapes and lengths • find thirds of sets • estimate the size of a fractional part before using eg paper folding to check or estimate the size of the whole from the part • find the whole from a part • use language 'one third', 'two thirds', 'three thirds' • use symbols to represent: 1/3, 2/3, 3/3
	2	Finding halves, thirds or quarters of shapes using partitioning	• recognise that equal shares are not always the same shape
Using fractions: thirds & sixths	1	Introducing sixths	• find sixths of objects and shapes • find sixths of sets • estimate the size of a fractional part before using, eg paper folding to check or estimate the size of the whole from the part • find the whole from a part • use language 'one sixth', 'two sixths', 'three sixths' • use symbols to represent: 1/6, 2/6, 3/6 • understand the relationship between thirds and sixths
	2	Finding thirds and sixths of objects, shapes and sets	• recognise equivalence • find thirds and sixths of objects, shapes and lengths • find thirds and sixths of sets (using models) • find the whole from a part • find thirds and sixths of uneven partitioned shapes • use language 'one third', 'two thirds', 'three thirds' • use fractional notation
Using fractions: fifths	1	Introducing fifths	• estimate the size of a fractional part before using, eg paper folding to check or estimate the size of the whole from the part • find fifths of objects, shapes and lengths • find fifths of sets • find the whole from a part • use language 'one fifth', 'two fifths', 'three fifths' and so on • use symbols to represent fractions 1/5, 2/5 ...

Victorian Curriculum Year 3

Understanding Practice and Fluency (UPF)

Number and Algebra

Money and financial mathematics

VCMNA137 Represent money values in multiple ways and count the change required for simple transactions to the nearest five cents			
Quest: Money			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Making purchases and calculating change	1	Using money to make purchases	• calculate the total cost of purchasing two items given their values and record the value in dollars and cents separately (no decimal point) • determine the exact notes and coins needed to purchase two items given their values
	2	Calculating change when making purchases	• determine one or more notes and coins that have enough value to make a purchase of one or more items • calculate the change required when making purchases using cash and record values in dollars and cents separately (no decimal point)

Patterns and algebra

VCMNA138 Describe, continue, and create number patterns resulting from performing addition or subtraction			
Quest: Number patterns			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Identifying and creating number patterns	1	Identifying and creating additive number patterns (3s, 4s, 6s, 7s, 8s, 9s, from any starting point within 100)	• identify additive number patterns, eg patterns that increase in 3s, 4s, 6s, 7s, 8s and 9s from any starting point • describe the rule for a forwards (additive) number pattern, eg 'It goes up by 3s' • continue and create an additive number pattern
	2	Identifying and creating subtractive number patterns (3s, 4s, 6s, 7s, 8s, 9s, from any starting point within 100)	• identify subtractive number patterns, eg patterns that decrease by 3s, 4s, 6s, 7s, 8s and 9s from any starting point • describe the rule for a backwards (subtractive) number pattern, eg 'It goes down by 3s' • continue and create a subtractive number pattern represented in numbers, on a number line or expressed in words, eg 'make a pattern that starts at 20 and shrinks by subtracting 2 each time'
	3	Identifying and creating additive and subtractive number patterns (3s, 4s, 6s, 7s, 8s, 9s, from any starting point within 100)	• identify additive or subtractive number patterns on a number line, hundreds chart or calendar, eg patterns that increase in 3s, 4s, 6s, 7s, 8s and 9s from any starting point • describe the rule for a forwards (additive) or backwards (subtractive) number pattern, eg 'It goes up by 3s' • continue and create an additive or subtractive number pattern represented in numbers, on a number line or expressed in words, eg 'make a pattern that starts at 0 and grows by adding 7 each time'

Victorian Curriculum Year 3

Understanding Practice and Fluency (UPF)

Number and Algebra

Patterns and algebra

VCMNA139 Use a function machine and the inverse machine as a model to apply mathematical rules to numbers or shapes			
Quest: Function machines			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Function machines with numbers	1	Recognising and using the inverse relationship between addition and subtraction	• determine, through investigation, the inverse relationship between addition and subtraction • determine the missing number in addition and subtraction equations using a variety of tools and strategies, such as the inverse relationship between addition and subtraction (up to 2 digit with 2-digit addition or subtraction)
	2	Recognising patterns with 1 operation involving addition, subtraction or multiplication (doubling) up to 1000	• identify patterns with involving addition, subtraction or multiplication on a number line, hundreds chart or calendar • describe the rule for a number pattern, eg 'It goes up by 3s', or 'it doubles each time'
	3	Using a function machine to model and apply simple increasing or decreasing rules to numbers (2, 5, 10 only for multiplication and division)	• use a function machine to model (eg identify missing shapes) a simple increasing or decreasing rule involving shapes • identify the simple increasing or decreasing rule in words or numbers for a function machine eg add 3 sides or add 3 sticks • use a function machine to model a simple transformation rule involving shapes, eg half-turn, flip, quarter turn clockwise, three quarter turn anti-clockwise • identify the simple rule in words eg 'half-turn'
	4	Using an inverse machine to model and apply simple increasing or decreasing rules to numbers	• use the inverse function machine for a related function machine to model (eg identify missing numbers) the decreasing inverse rule, eg function machine rule = Add 4 sides so inverse function machine rule = Subtract 4 sides • identify the simple decreasing rule in words or numbers for an inverse function machine, eg 'Subtract 6 sides' • use the inverse function machine for a related function machine to model (eg identify missing numbers) the increasing inverse rule, eg function machine rule = Subtract 4 sides so inverse function machine rule = Add 4 sides • identify the simple increasing rule in words or numbers for an inverse function machine, eg 'Add 6 sides'
Function machines with shapes	1	Using a function machine to model and apply simple rules to shapes	• use a function machine to model (eg identify missing shapes) a simple increasing or decreasing rule involving shapes • identify the simple increasing or decreasing rule in words or numbers for a function machine eg add 3 sides or add 3 sticks • use a function machine to model a simple transformation rule involving shapes, eg half-turn, flip, quarter turn clockwise, three quarter turn anti-clockwise • identify the simple rule in words eg 'half-turn'
	2	Using an inverse machine to model and apply simple increasing or decreasing rules to shapes	• use the inverse function machine for a related function machine to model (eg identify missing numbers) the decreasing inverse rule, eg function machine rule = Add 15 so inverse function machine rule = Subtract 15 • identify the simple decreasing rule in words or numbers for an inverse function machine, eg 'Subtract 20' • use the inverse function machine for a related function machine to model (eg identify missing numbers) the increasing inverse rule, eg function machine rule = Subtract 15 so inverse function machine rule = Add 15 • identify the simple increasing rule in words or numbers for an inverse function machine, eg ''Add 20'

Victorian Curriculum Year 3

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Using units of measurement

VCMMG140 Measure, order and compare objects using familiar metric units of length, area, mass and capacity			
Quest: Length, mass and capacity			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Comparing, ordering and measuring length	1	Comparing lengths in metres and centimetres	• compare lengths and distances using metres and centimetres
	2	Ordering lengths in metres and centimetres	• order lengths and distan ces using metres and centimetres
	3	Estimating and measuring to the nearest centimetre	• estimate lengths and check by measuring; explain strategies used to estimate lengths and distances, such as by * referring to a known length, eg 'My handspan is 10 cm and my desk is 8 handspans long, so my desk is about 80 cm long' • measure lengths and distances to the nearest centimetre using a centimetre ruler • record lengths and distances using the abbreviation for centimetres (cm)
	4	Measuring in metres and centimetres	• estimate and measure lengths and distances using metres and centimetres • explain strategies used to estimate lengths and distances, such as by referring to a known length, eg 'My handspan is 10 cm and my desk is 8 handspans long, so my desk is about 80 cm long' • record lengths and distances using abbreviations for metres and centimetres, eg 1 m 25 cm
	5	Introducing formal units for length: millimetres	• recognise the need for a formal unit smaller than the centimetre to measure length • develop a personal reference for the approximate length of 1 mm • recognise and model that there are 10 mm in 1 cm, ie 10 mm = 1 cm • estimate and use the millimetre as a unit to measure lengths to the nearest millimetre using a ruler • record lengths using the abbreviation for millimetres (mm), eg 5 cm 3 mm or 53 mm • compare lengths with the same standard unit
Measure & compare units of volume & capacity	1	Introducing formal units for volume and capacity: litres	• recognise and explain the need for formal units to measure volume and capacity • develop a personal reference for one litre and fractions of 1 litre (quarters and halves); relate the litre to familiar everyday containers, eg milk cartons • recognise that one-litre containers can be a variety of shapes • record volumes and capacities using the abbreviation for litres (L)
	2	Estimating, comparing and measuring in litres	• estimate and measure capacities to the nearest litre • compare and order 2 or more containers by capacity measured in litres, including the capacity of commercially packaged objects whose capacity is stated in litres • record volumes and capacities using the abbreviation for litres (L)

Victorian Curriculum Year 3

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Using units of measurement

VCMMG140 Measure, order and compare objects using familiar metric units of length, area, mass and capacity			
Quest: Length, mass and capacity			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Using the kilogram to measure mass	1	Introducing formal units for mass: the kilogram	• establish the need for formal units to measure mass and introduce the kilogram • develop a sense of the mass of 1 kilogram and identify objects that have mass 'about 1 kilogram', 'less than 1 kilogram', 'greater than 1 kilogram', eg a litre of milk is about 1 kilogram, a standard pack of flour is 1 kilogram • identify everyday situations where kilograms are an appropriate unit for measuring the mass • introduce the abbreviation 'kg' for recording mass in kilograms
	2	Measuring mass in kilograms	• compare and order 2 or more objects by mass measured to the nearest kilogram using carried scales • estimate the number of objects that have a total mass of 1 kilogram and check by measuring • estimate mass using a personal reference for a kilogram • record mass using the abbreviation 'kg' • compare masses using uniform informal units and the symbols >, =, < • compare masses using simple scaling by integers, eg 'five times as heavy'

Shape

VCMMG141 Tell time to the minute and investigate the relationship between units of time			
Quest: Telling time			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Telling time to the minute	1	Telling time to the minute (analogue)	• read time on analogue clocks to the minute using the terms 'o'clock', 'past' and 'to', including 'half-past', 'quarter past' and 'quarter to' • observe and describe the position or draw of the hands of an analogue clock when reading time to the minute, including the hour hand, minute hand and second hand • position or draw the hands on an analogue clock to show time to the minute where the time is given using the terms 'o'clock', 'past' and 'to', including 'half-past', 'quarter past' and 'quarter to'
	2	Telling time to the minute (digital)	• read time on 12-hour digital clocks to the minute using the terms 'o'clock', 'past' and 'to', including 'half-past', 'quarter past' and 'quarter to' and write in words • record times on analogue clocks to the minute in 12-hour digital format • position or draw the hands on an analogue clock to show time to the minute where the time is given in 12-hour digital format • connect 12-hour digital displays for times the minute to their corresponding display on an analogue clock

Victorian Curriculum Year 3

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Shape

VCMMG142 Make models of three-dimensional objects and describe key features			
Quest: 3D objects			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Exploring prisms and nets	1	Introducing rectangular prisms	• manipulate and describe the attributes of rectangular prisms • recognise that a cube is a special kind of rectangular prism • recognise rectangular prisms in the environment and drawings
	2	Exploring prisms	• manipulate and describe the attributes of prisms • recognise that a cube is a special kind of prism • recognise prisms in the environment and drawings
	3	Comparing, sorting and naming prisms and pyramids	• compare and sort prisms and pyramids by their geometric properties, eg number of edges, number of vertices • describe and name prisms and pyramids by the shape of their base
		Comparing three-dimensional objects including pyramids, prisms, cones, spheres and cylinders	• describe similarities and differences between prisms (including cubes), pyramids, cylinders, cones and spheres, eg surfaces, faces, edges and vertices • recognise and describe the use of three-dimensional objects in a variety of contexts, eg buildings, packaging • identify and name three-dimensional objects as prisms (including cubes), pyramids, cylinders, cones and spheres
	4	Making basic models of three-dimensional objects	• use a variety of materials to make models of prisms (including cubes), pyramids, cylinders, cones and spheres, given a three-dimensional object, picture or photograph to view • identify and describe the two-dimensional shapes that can be found in a three-dimensional object, eg build a structure using concrete materials and describe it using geometric terms so that a partner will be able to build it
Rectangular prism nets	1	Introducing nets of rectangular prisms	• deconstruct everyday packages that are prisms (including cubes) to create nets, eg cut up tissue boxes • make connections between nets and the two-dimensional shapes of the faces • recognise that a net requires each face to be connected to at least 1 other face • investigate, make and identify the variety of nets that can be used to create a particular prism, such as the variety of nets that can be used to make a cube
	2	Introducing nets of prisms	• deconstruct everyday packages that are prisms (including cubes) to create nets, eg cut up tissue boxes • make connections between nets and the two-dimensional shapes of the faces • recognise that a net requires each face to be connected to at least 1 other face • investigate, make and identify the variety of nets that can be used to create a particular prism, such as the variety of nets that can be used to make a cube • compare two-dimensional shapes to parts of three-dimensional objects in the environment

Victorian Curriculum Year 3

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Location and transformation

VCMMG143 Create and interpret simple grid maps to show position and pathways			
Quest: Grid referenced maps			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Interpreting and creating grid referenced maps	1	Interpreting grid referenced maps	• establish that grid referencing on maps allows for more accurate description of features/locations • understand the structure (letter then number, horizontal then vertical) and meaning of grid references (everything in that grid square) • use grid references to describe features/locations on maps • identify features/locations on maps given their gird reference
	2	Creating grid referenced maps	• draw grid referenced maps of familiar locations such as the classroom, school or local area • use technology to create grid referenced maps of familiar locations such as the classroom, school or local area
	3	Drawing pathways on grid referenced maps	• draw a path from 1 feature to another on a grid referenced map given the grid reference of each feature • use grid references to describe a path from 1 feature to another on a grid referenced map
VCMMG144 Identify symmetry in the environment			
Quest: Lines of symmetry			
Recognising and drawing lines of symmetry	1	Recognising line symmetry in the environment	• observe and describe symmetry informally in everyday objects, pictures, designs and shapes • identify shapes that are symmetrical and are not symmetrical by folding to test for symmetry • sort objects, pictures, designs and/or shapes according to whether they are symmetrical or not • draw a single line of symmetry on given pictures, designs and shapes
	2	Recognising line symmetry of shapes	• define the line of symmetry of a two-dimensional shape as a line across which the shape can be folded into 2 matching parts • identify a line of symmetry in two-dimensional shapes • sort two-dimensional shapes according to whether they are symmetrical or not
	3	Drawing lines of symmetry on given designs and shapes	• recognise that some designs and shapes may have more than 1 line of symmetry • identify and draw all lines of symmetry on designs and shapes • determine the total number of lines of symmetry on designs and shapes • determine whether or not a given line through designs and shapes is a line of symmetry

Victorian Curriculum Year 3

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Geometric reasoning

VCMMG146 Identify angles as measures of turn and compare angle sizes in everyday situations			
Quest: Identifying and comparing angles			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Identifying and comparing angles	1	Introducing right angles	• identify right angles on two-dimensional shapes and three-dimensional objects • identify right angles in pictures, designs and the environment identify right angles in line diagrams • use and interpret the symbol □ in diagrams to represent a right angle • define perpendicular lines and identify them in pictures, designs and the environment • recognise that a pair of perpendicular lines form 4 right angles
	2	Comparing angles informally	• compare angles directly by placing 1 angle over another • compare angles indirectly by using a hinged angle measurer
Introducing angles	1	Introducing the concept of angles up to 180°	• understand and describe angles as an amount of turning, openings • identify angles in everyday situations, eg door openings, designs, between the arms of a clock • recognise that angles are formed whenever 2 lines meet or when 2 rays meet at a common endpoint

Victorian Curriculum Year 3

Understanding Practice and Fluency (UPF)

Statistics and Probability

Chance

VCMSP147 Conduct chance experiments, identify and describe possible outcomes and recognise variation in results			
Quest: Conducting chance experiments			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Conducting chance experiments	1	Introducing chance experiments (with equal outcomes)	• use the term 'outcome' to describe any possible result of a chance experiment • predict and list all possible outcomes in a chance experiment, eg list the outcomes when 3 pegs are randomly selected from a bag containing an equal number of pegs of 2 colours • predict the number of times each outcome should occur in a chance experiment involving a set number of trials
	2	Conducting chance experiments (with equal outcomes)	• predict and list all possible outcomes in a chance experiment, eg list the outcomes when 3 pegs are randomly selected from a bag containing an equal number of pegs of 2 colours • keep a tally and graph the results of a chance experiment • explain any differences between expected results and actual results in a chance experiment; make statements that acknowledge 'randomness' in a situation, eg 'The spinner could stop on any colour'
	3		• use the term 'outcome' to describe any possible result of a chance experiment • predict and list all possible outcomes in a chance experiment, eg describe the probability of spinning red when you spin a spinner that has 1/2f shaded yellow, 1/4 shaded blue and 1/4 shaded red • predict the number of times each outcome should occur in a chance experiment involving a set number of trials
	4	Conducting chance experiments (with unequal outcomes)	• predict and list all possible outcomes in a chance experiment, eg describe the probability of spinning red when you spin a spinner that has 1/2 shaded yellow, 1/4 shaded blue and 1/4 shaded red • keep a tally and graph the results of a chance experiment • explain any differences between expected results and actual results in a chance experiment; make statements that acknowledge 'randomness' in a situation, eg 'The spinner could stop on any colour'
	5	Introducing chance situations	• predict and record all possible combinations in a chance situation, eg list all possible outfits when choosing from three different T-shirts and 2 different pairs of shorts • record and explain possible combinations using a list, table or diagram • repeat a chance experiment several times and discuss why the results vary

Victorian Curriculum Year 3

Understanding Practice and Fluency (UPF)

Statistics and Probability

Data representation and interpretation

VCMSP148 Identify questions or issues for categorical variables. Identify data sources and plan methods of data collection and recording			
Quest: Data sources and collecting data			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Introducing the statistical investigation process	1	Introducing the statistical investigation process (including line plots)	• determine what data to gather in order to investigate a question of interest, eg colour, mode of transport, gender, type of animal, sport • collect data through questioning and record the data using tally marks • dentify categories of data and use them to sort data, eg sort data collected on attendance by day of the week and into boys and girls present • represent numerical or category data in a table, list or picture graph (one-to-one correspondence) • record observations based on data collected and displayed in a list, table, picture graph or line plot
	2	Introducing the statistical investigation process (tables, lists, picture graphs or bar graphs)	• determine what data to gather in order to investigate a question of interest, eg colour, mode of transport, gender, type of animal, sport • collect data through questioning and record the data using tally marks • identify categories of data and use them to sort data, eg sort data collected on attendance by day of the week and into boys and girls present • represent category data in a table, list, bar graph or picture graph (one-to-one correspondence) • record observations based on data collected and displayed in a list, table, picture graph, or simple bar graph
Category data	1	Posing questions related to category data	• pose questions about a matter of interest to obtain information that can be recorded in categories • adjust statistical questions to ensure their suitability • recognise that data can be collected by the user or others; identify possible sources of data collected by others, eg newspapers, government data-collection agencies, sporting agencies, environmental groups • pose questions based on category data recorded by others
	2	Collecting and recording category data	• predict and create a list of categories for efficient data collection in relation to a matter of interest, eg 'Which breakfast cereal is the most popular with members of our class?' • collect data by conducting a simple survey and create a list or table (with and without digital technology) to organise the data, eg collect data on the number of each colour of lollies in a packet • compare collection and recording methods

Victorian Curriculum Year 3

Understanding Practice and Fluency (UPF)

Statistics and Probability

Data representation and interpretation

Learning Journey	Steps	Spine Nodes	Subnodes
VCMSP149 Collect data, organise into categories and create displays using lists, tables, picture graphs and simple column graphs, with and without the use of digital technologies			
Quest: Collecting and organising data			
Statistical Investigations	1	Constructing and interpreting tables	• represent given or collected categorical data in tables using appropriate headings and structure • interpret data in tables to solve problems; answer comparative and summative questions
	2	Conducting a simple statistical investigation (tables, lists, picture graphs, bar graphs)	• determine what data to gather in order to investigate a statistical question collect, record and sort data • represent category data in a table, list, picture graph or column graph (including many-to-one correspondence) • make a simple concluding statement based on data collected
Representing and interpreting data displays	1	Introducing and reading data in column graphs with one-to-one correspondence	• become familiar with the structure and layout of a basic column graph including title, labels on each axis, equal spacing • answer one-step and two-step questions, eg, 'How many more students like reading than art?'; identify basic similarities and differences between categories; make simple conclusions "" • recognise and remedy errors in column graphs
	2	Representing and reading data in a given column graph with one-to-one correspondence	• complete a vertical or horizontal column graph (one-to-one correspondence) ; choose the correct title for a bar graph • answer one-step and two-step questions, eg, 'How many more students like reading than art?'; identify basic similarities and differences between categories; make simple conclusions • agree or disagree with simple statements made by others related to data in a column graph
	3	Representing and reading data displayed in tables or lists	• display category or numerical data using lists and tables • pose questions and answer one-step and two-step questions, eg 'How many more students like reading than art?'; identify basic similarities and differences between categories; make simple conclusions
	4	Representing and reading category data in a table	• represent primary or secondary data in a given table using appropriate headings and layout • interpret data in a table; ask and answer summative and comparative questions
VCMSP150 Interpret and compare data displays			
Quest: Data displays			
Comparing data displays	1	Comparing basic data displays (tables, lists, picture graphs, column graphs)	• represent the same data set using more than one type of display (tables, lists, picture graphs or column graphs) and compare the displays • discuss the advantages and/or disadvantages of different representations of the same data • describe information and make conclusions about data presented in different data displays, eg 'Football is the most popular sport for students in Year 3 at our school'

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

Learning Journey	Steps	Spine Nodes	Subnodes
VCMNA151 Investigate and use the properties of odd and even numbers			
Quest: Properties of odd and even numbers			
Odd and even numbers	1	Using the properties of odd and even numbers	• investigate and generalise the result of adding, subtracting and multiplying pairs of even numbers, pairs of odd numbers, or one even and one odd number, eg even + odd = odd, odd × odd = odd • explain why the result of a calculation is even or odd with reference to the properties of the numbers used in the calculation • predict whether the answer to a calculation will be even or odd by using the properties of the numbers in the calculation • investigate the place value of digits within odd and even numbers
VCMNA152 Recognise, represent and order numbers to at least tens of thousands			
Quest: Numbers up to 5 digits			
Comparing and ordering numbers up to 5 digits	1	Comparing 5-digit numbers using words and symbols	• compare two 5-digit numbers using words and symbols <, =, >
	2	Ordering numbers up to 5 digits	• arrange numbers of up to 5 digits in ascending and descending order
Place value up to 5 digits	1	Reading and writing numbers up to 5 digits	• apply an understanding of place value to read numbers up to 5 digits • apply an understanding of place value to write numbers up to 5 digits
	2	Identifying the place value of digits in numbers up to 5 digits	• state the place value of digits in numbers of up to 5 digits • pose and answer questions that extend place value understanding of numbers, eg 'What happens if I rearrange the digits in the number 12 345?', 'How can I rearrange the digits to make the largest number?' • represent and describe whole numbers to 10 000 pictorially and symbolically
	3	Finding the number 1000 more or 1000 less than a given number	• apply an understanding of place value to find the number 1000 more or 1000 less
Using place value to partition: up to 5 digits	1	Using place value to partition 5-digit numbers	• use place value to partition numbers of up to 5 digits, eg 67 012 is 60 000 + 7000 + 10 + 2
	2	Using non-standard partitioning with 5-digit numbers	• partition numbers of up to 5 digits in non-standard forms, eg 67 000 as 50 000 + 17 000
	3	Understanding the relationship between place value positions	• recognise that in a multi-digit number a digit in 1 place represents 10 times as much as it represents in the place to its right • recognise that in a multi-digit number a digit in 1 place represents 1/10 of what it represents in the place to its left
Rounding numbers: 5 digits	1	Rounding 5-digit numbers	• round to the nearest 10, 100, 1000 or 10,000

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA153 Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problem			
Quest: Addition and subtraction strategies			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Representing problems using a bar model	1	Representing addition problems using a bar model (within 1000)	• represent an addition problem where the result is unknown, eg 'Anna had 58 marbles. Sam gave her 27 more. How many marbles does Anna have now?' • represent addition problems where the change or part is unknown, eg 'Anna has 58 marbles, how many more does she need to have 73? or Anna had 53 marbles. 17 were yellow. How many were red?' • represent addition problems where the start is unknown, eg 'Anna had some marbles. Sam gave her 17 more. Now she has 53. How many did she have to start with?' • solve addition problems represented on a bar model using efficient mental strategies
	2	Representing subtraction problems using a bar model (within 1000)	• represent subtraction problems where the result is unknown, ag 'Anna had 52 marbles. She gave 17 to Sam. How many marbles does she have left?' • represent and solve subtraction problems where the change is unknown, eg 'Anna had 52 marbles. She gave some to Sam. Now she has 15 left. How many marbles did she give to Sam?' • represent and solve subtraction problems where the start is unknown, eg 'Anna gave 27 marbles to Sam. Now she has 5 marbles left. How many marbles did Anna begin with?' • solve subtraction problems represented on a bar model using efficient mental strategies
	3	Representing comparison problems using a bar model (within 1000)	• represent and solve comparison problems where the difference is unknown, eg 'Anna has 13 plums. Sam has 7 plums. How many more plums does Anna have?' • represent and solve comparison problems where the referent is unknown, eg 'Anna has 43 marbles. She has 17 more than Sam. How many marbles does Sam have?' • represent and solve subtraction problems where the comparison quantity is unknown, eg 'Sam has 17 marbles. Anna has 35 more marbles. How many marbles does Anna have?' • solve comparison problems represented on a bar model using efficient mental strategies

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA153 Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problem			
Quest: Addition and subtraction strategies			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Add/subtract: efficient strategies	1	Choosing efficient mental addition strategies with numbers up to five digits	• apply place value and partitioning to rearrange and regroup numbers to assist with calculations, eg use rounding and compensating, bar model, jump strategies, split strategies, place value strategies or bridging strategies • use a range of recording methods to solve addition problems, eg number sentences, empty number line, regrouping
	3	Solving one-step word problems using efficient mental addition strategies with numbers up to five digits	• solve addition word problems using mental strategies
	2	Choosing efficient mental subtraction strategies with numbers up to five digits	• apply place value and partitioning to rearrange and regroup numbers to assist with calculations, eg use rounding and compensating, jump strategies, split strategies, place value strategies or bridging strategies • use a range of recording methods to solve subtraction problems, eg number sentences, empty number line, regrouping
	4	Solving word problems using efficient mental subtraction strategies with numbers up to five digits	• solve subtraction word problems using mental strategies
Posing addition and subtraction problems	1	Posing simple addition problems	• pose a simple word problem to represent an addition number sentence • select number ranges that are appropriate for the context
	2	Posing simple subtraction problems	• pose a simple word problem to represent a subtraction number sentence; represent both 'take away' and 'comparison' problems • select number ranges that are appropriate for the context; must take the smaller value away from the larger value
Addition Algorithms (without carrying)	1	Using a formal written algorithm for addition calculations up to two-digit numbers (no carrying)	• apply algorithms to solve problems without carrying, with the same number of places and with a different number of places • use estimation or reverse operation to check the reasonableness of solutions
	2	Using a formal written algorithm for addition calculations up to three-digit numbers (no carrying)	• apply algorithms to solve problems without carrying, with the same number of places and with a different number of places • use estimation or reverse operation to check the reasonableness of solutions
	3	Using a formal written algorithm for addition calculations up to four-digit numbers (no carrying)	• apply algorithms to solve problems without carrying, with the same number of places and with a different number of places • use estimation or reverse operation to check the reasonableness of solutions
	4	Using a formal written algorithm for addition calculations up to five-digit numbers (no carrying)	• apply algorithms to solve problems without carrying, with the same number of places and with a different number of places ; include opportunities for students to write their own algorithms with digits in correct place value positions; include word problems • use estimation or reverse operation to check the reasonableness of solutions

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA153 Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problem			
Quest: Addition and subtraction strategies			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Addition Algorithms (with carrying)	1	Using a formal written algorithm for addition calculations up to two-digit numbers (with carrying)	• apply algorithms to solve problems with carrying in 1 or more places, with the same number of places and with a different number of places • use estimation or reverse operation to check the reasonableness of solutions
	2	Using a formal written algorithm for addition calculations with three-digit and one-digit numbers (with carrying)	• apply algorithms to solve problems with carrying; include opportunities for students to write their own algorithms with digits in correct place value positions; include word problems • use estimation or reverse operation to check the reasonableness of solutions
		Using a formal written algorithm for addition calculations with three-digit and two-digit numbers (with carrying)	• apply algorithms to solve problems with carrying in 1 or more places; include opportunities for students to write their own algorithms with digits in correct place value positions; include word problems • use estimation or reverse operation to check the reasonableness of solutions
	3	Using a formal written algorithm for addition calculations of two three-digit numbers (with carrying)	• apply algorithms to solve problems with carrying in 1 or more places; include opportunities for students to write their own algorithms with digits in correct place value positions; include word problems • use estimation or reverse operation to check the reasonableness of solutions
		Using a formal written algorithm for addition calculations up to three-digit numbers (with carrying)	• apply algorithms to solve problems with carrying in 1 or more places, with the same number of places and with a different number of places; include opportunities for students to write their own algorithms with digits in correct place value positions; include word problems • use estimation or reverse operation to check the reasonableness of solutions
	4	Using a formal written algorithm for addition calculations up to four-digit numbers (with carrying)	• apply algorithms to solve problems with carrying in 1 or more places, with the same number of places and with a different number of places; include opportunities for students to write their own algorithms with digits in correct place value positions; include word problems • use estimation or reverse operation to check the reasonableness of solutions
	5	Using a formal written algorithm for addition calculations up to five-digit numbers (with carrying)	• apply algorithms to solve problems with carrying in 1 or more places, with the same number of places and with a different number of places; include opportunities for students to write their own algorithms with digits in correct place value positions; include word problems • use estimation or reverse operation to check the reasonableness of solutions

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA153 Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problem			
Quest: Addition and subtraction strategies			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Addition Algorithms (with/ without carrying)	1	Using a formal written algorithm for addition calculations of 3 or more addends up to two digits (with and without carrying)	• apply algorithms with 3 or more addends with the same number of places and with a different number of places
	2	Using a formal written algorithm for addition calculations of 3 or more addends up to 3 digits (with and without carrying)	• apply algorithms with 3 or more addends with the same number of places and with a different number of places; include number range that involves carrying more than 1 ten or hundred; include word problems • use estimation to check the reasonableness of solutions
	3	Using a formal written algorithm for addition calculations of 3 or more addends up to four digits (with and without carrying)	• apply algorithms with 3 or more addends with the same number of places and with a different number of places; include number range that involves carrying more than 1 ten, hundred or thousand; include word problems
	4	Using a formal written algorithm for addition calculations of 3 or more addends up to 5 digits (with and without carrying)	• apply algorithms with 3 or more addends with the same number of places and with a different number of places; include number range that involves carrying more than 1 in one or more places; include word problems
Subtraction Algorithms (without decomposing)	1	Using a formal written algorithm to record subtraction calculations involving up to two-digit numbers (without decomposing)	• apply algorithms to solve problems without trading (decomposing), with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend); include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first; include word problems • use estimation or reverse operation to check the reasonableness of solutions
	2	Using a formal written algorithm to record subtraction calculations involving up to three-digit numbers (without decomposing)	• apply algorithms to solve problems without trading (decomposing), with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend); include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first; include word problems • use estimation or reverse operation to check the reasonableness of solutions
	3	Using a formal written algorithm to record subtraction calculations involving up to four-digit numbers (without decomposing)	• apply algorithms to solve problems without trading (decomposing), with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend); include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first; include word problems • use estimation or reverse operation to check the reasonableness of solutions

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA153 Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problem			
Quest: Addition and subtraction strategies			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Subtraction Algorithms (without decomposing)	4	Using a formal written algorithm to record subtraction calculations involving up to five-digit numbers (without decomposing)	• apply algorithms to solve problems without trading (decomposing), with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend); include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first; include word problems • use estimation or reverse operation to check the reasonableness of solutions
Subtraction Algorithms (with decomposing)	1	Using a formal written algorithm to record subtraction calculations involving up to two-digit numbers (with decomposing)	• apply algorithms to solve problems with trading (decomposing) in one or more places, with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without one or more zeros in the first number (minuend); include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first; include word problems • use estimation or reverse operation to check the reasonableness of solutions
	2	Using a formal written algorithm to record subtraction calculations involving up to three-digit numbers (with decomposing)	• apply algorithms to solve problems with trading (decomposing) in 1 or more places, with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend); include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first; include word problems • use estimation or reverse operation to check the reasonableness of solutions
	3	Using a formal written algorithm to record subtraction calculations involving up to four-digit numbers (with decomposing)	• apply algorithms to solve problems with trading (decomposing) in 1 or more places, with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend); include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first; include word problems • use estimation or reverse operation to check the reasonableness of solutions
	4	Using a formal written algorithm to record subtraction calculations involving up to five-digit numbers (with decomposing)	• apply algorithms to solve problems with trading (decomposing) in 1 or more places, with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend); include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first; include word problems • use estimation or reverse operation to check the reasonableness of solutions
Add/Subtract: Word problems	1	Solving addition and subtraction two-step problems in context (max sum 1000)	• read and interpret a word problem • decide with operations and strategies to use and explain why • solve an addition and subtraction two-step problem

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

Learning Journey	Steps	Spine Nodes	Subnodes
VCMNA154 Investigate number sequences involving multiples of 3, 4, 6, 7, 8, and 9			
Quest: Investigating sequences with multiples			
Investigating sequences with multiples	1	Investigating number sequences involving multiples of 3, 4, 6, 7, 8 and 9	• generate number patterns using multiples of 3, 4, 6, 7, 8 and 9 • investigate visual number patterns on a number chart • find missing terms in a number sequence
VCMNA155 Recall multiplication facts up to 10 × 10 and related division facts			
Quest: Multiplication and division facts			
Multiplication/ Division facts for 4	1	Recalling multiplication facts for 4	• recall the multiplication facts for 4
		Using multiplication facts for 4	• solve and create multiplication problems in context (using multiplication facts for 4), including word problems
	2	Dividing by 4	• model and describe the related multiplication and division facts for 4 using models, drawings or manipulatives, eg 4 x 3 = 12 and 12 divided by 3 = 4 • relate division to how many (whole) times the divisor goes into the dividend
		Recalling division facts for 4	• recall the division facts for 4
	3	Using division facts for 4	• solve and create division problems in context (using multiplication facts for 4), including word problems
	4	Multiplying and dividing by 4	• recall the multiplication facts and related division facts for 4 • solve multiplication and division problems with 4, including word problems
Multiplication/ Division facts up to 5	1	Multiplying by 2, 5, 3 and 4 (1 - 10)	• recall the multiplication facts for 2s, 5s, 3s and 4s • solve multiplication problems with 2, 5, 3 and 4, including word problems
	2	Dividing by 2, 5, 3 and 4 (1 - 10)	• recall the division facts for 2s, 5s, 3s and 4s • solve division problems with 2, 5, 3 and 4, including word problems
	3	Multiplying and dividing by 2, 5, 3 and 4 (1 - 10)	• recall the multiplication and division facts for 2s, 5s, 3s and 4s • solve multiplication and division problems with 2, 5, 3 and 4, including word problems
	4	Recalling multiplication facts to 5 x 5	• recall multiplication facts to 5 x 5
Multiplication and division facts and properties	1	Relating multiplication and division facts through fact families	• model and describe the fact families for 2, 3, 4, 5 and 10 multiplication facts, eg 3 x 4 = 12, 4 x 3 = 12, 12 divided by 3 = 4 and 12 divided by 4 equals 3 • explain why a rectangular array can be read as a division in 2 ways by forming vertical or horizontal groups, eg 12 ÷ 3 = 4 or 12 ÷ 4 = 3
	2	Recalling multiplication facts up to 10 × 10 with automaticity	• recall facts in order • recall facts in random order • create a table or simple spreadsheet to record multiplication facts
	3	Using the commutative property of multiplication up to 10 x 10	• use the commutative property of multiplication, eg 7 x 9 = 9 x 7

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA155 Recall multiplication facts up to 10 × 10 and related division facts			
Quest: Multiplication and division facts			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Exploring multiplication/ division for 6 up to 60	1	Exploring multiplication by 6 up to 60	• use concrete materials, models, drawings, number lines/ charts to skip count by 6 from zero; explore patterns of the multiplication facts for 6 on a number chart • relate multiplication by 6 to double multiplication by 3
	2	Recalling and using multiplication facts for 6 (up to 60)	• recall the multiplication facts for 6 • solve multiplication problems with 6 including word problems
	3	Dividing by 6 up to 60	• model and describe the related multiplication and division facts for 6 using models, drawings or manipulatives, eg 6 x 3 = 18 and 18 divided by 3 = 6 • relate division to how many (whole) times the divisor goes into the dividend
	4	Recalling and using division facts for 6 up to 60	• recall the division facts for 6 • solve division problems with 6 including word problems
	5	Multiplying and dividing by 6 up to 60	• recall the multiplication facts and related division facts for 6 • solve multiplication and division problems with 6, including word problems
Exploring multiplication/ division for 7 up to 70	1	Exploring multiplication by 7 up to 70	• use concrete materials, models, drawings, number lines/ charts to skip count by 7 from zero; explore patterns of the multiplication facts for 7 on a number chart
	2	Recalling and using multiplication facts for 7 (up to 70)	• recall the multiplication facts for 7 • solve multiplication problems with 7 including word problems
	3	Dividing by 7 up to 70	• model and describe the related multiplication and division facts for 7 using models, drawings or manipulatives, eg 7 x 3 = 21 and 21 divided by 3 = 7 • relate division to how many (whole) times the divisor goes into the dividend
	4	Recalling and using division facts for 7 up to 70	• recall the division facts for 7 • solve division problems with 7 including word problems
	5	Multiplying and dividing by 7 up to 70	• recall the multiplication facts and related division facts for 7 • solve multiplication and division problems with 7, including word problems
Exploring multiplication/ division for 8 up to 80	1	Exploring multiplication by 8 up to 80	• use concrete materials, models, drawings, number lines/ charts to skip count by 8 from zero; explore patterns of the multiplication facts for 8 on a number chart • relate multiplication by 8 to double multiplication by 4
	2	Recalling and using multiplication facts for 8 (up to 80)	• recall the multiplication facts for 8 • solve multiplication problems with 8 including word problems
	3	Dividing by 8 up to 80	• model and describe the related multiplication and division facts for 8 using models, drawings or manipulatives, eg 8 x 3 = 24 and 24 divided by 3 = 8 • relate division to how many (whole) times the divisor goes into the dividend

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

Learning Journey	Steps	Spine Nodes	Subnodes
VCMNA155 Recall multiplication facts up to 10 × 10 and related division facts			
Quest: Multiplication and division facts			
Exploring multiplication/ division for 8 up to 80	4	Recalling and using division facts for 8 up to 80	• recall the division facts for 8 • solve division problems with 8 including word problems
	5	Multiplying and dividing by 8 up to 80	• recall the multiplication facts and related division facts for 8 • solve multiplication and division problems with 8, including word problems
Exploring multiplication/ division for 9 up to 90	1	Exploring multiplication by 9 up to 90	• use concrete materials, models, drawings, number lines/ charts to skip count by 9 from zero; explore patterns of the multiplication facts for 9 on a number chart • relate multiplication by 9 to multiplication by 10 (multiply by 10 and then subtract the extra group)
	2	Recalling and using multiplication facts for 9 (up to 90)	• recall the multiplication facts for 9 • solve multiplication problems with 9 including word problems
	3	Dividing by 9 up to 90	• model and describe the related multiplication and division facts for 9 using models, drawings or manipulatives, eg 9 x 3 = 27 and 27 divided by 3 = 9 • relate division to how many (whole) times the divisor goes into the dividend
	4	Recalling and using division facts for 9 up to 90	• recall the division facts for • solve division problems with 9 including word problems
	5	Multiplying and dividing by 9 up to 90	• recall the multiplication facts and related division facts for 9 • solve multiplication and division problems with 9, including word problems
VCMNA156 Develop efficient mental and written strategies and use appropriate digital technologies for multiplication and for division where there is no remainder			
Quest: Mult and div strategies, no remainder			
Using facts to multiply using 2-digits	1	Representing and using known facts to solve multiplication and division problems with multiples of 10 and 100	• represent with models/diagrams and use known facts and place value understanding to solve multiplication problems with multiples of 10 or 100, eg 3 x 6 = 18 so 3 x 600 = 1800 • use known facts and place value understanding to solve division problems with multiples of 10 or 100, eg 18 ÷ 6 = 3 so 1800 ÷ 600 = 3 • explain and justify the use of the strategy
	2	Representing and using known facts to multiply two 2-digit multiples of 100	• represent with models/diagrams and use known facts and place value understanding to multiply 2 multiples of 100, eg 300 x 400 = 3 x 4 = 12 so 300 x 400 = 1200 • know that multiplying by 100 shifts the digits 2 places to the left
	3	Representing and using known facts to multiply 2-digit numbers by 100	• represent with models/diagrams and use known facts and place value understanding to multiply 2-digit numbers by 100, eg 13 x 100 = 10 x 100 + 3 x 100 • know that multiplying by 100 shifts the digits 2 places to the left
Using facts to divide 3-digit numbers by 10	1	Representing and using known facts to divide 3-digit numbers by 10	• represent with models/diagrams and use known facts and place value understanding to divide 2-digit numbers by 10, eg 460 ÷10 = 46 • know that dividing by 10 shifts the digits 1 place to the right

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA156 Develop efficient mental and written strategies and use appropriate digital technologies for multiplication and for division where there is no remainder			
Quest: Mult and div strategies, no remainder			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Multiplication strategies using 1-digit	1	Representing and multiplying two 1-digit numbers using rounding and compensating	• represent with models/diagrams and use known facts to solve multiplication problems by adding on or taking off, eg 5 × 10 is 50, so 5 × 9 is 5 less, which is 45 • explain and justify the use of the strategy
	2	Representing and multiplying two 1-digit numbers using doubling and related facts	• represent with models/diagrams and use the relationship between multiplication facts, eg the multiplication facts for 6 are double the multiplication facts for 3 • explain and justify the use of the strategy
	3	Representing and multiplying two 1-digit numbers using repeated doubling	• represent with models/diagrams and use doubling and repeated doubling as a strategy to multiply by 2, 4 and 8, eg 7 × 8 is double 7, double again and then double again • explain and justify the use of the strategy
	4	Representing and multiplying two 1-digit numbers using factorising	• represent with models/diagrams and split factors, eg 5 × 8 is the same as 5 × 2 × 4, which becomes 10 × 4 • explain and justify the use of the strategy
Using the conventions of multiplication	?	Using the conventions of multiplication number sentences	• use the term 'product' to describe the result of multiplying 2 or more numbers • use the equals sign to record equivalent number relationships involving multiplication, and to mean 'is the same as', rather than to mean to perform an operation
Multiples and factors up to 100	1	Introducing multiples up to 100	• find 'multiples' for a given whole number
	2	Introducing factors for numbers up to 100	• determine 'factors' for a given whole number • connect number relationships involving multiplication to factors of a number
Inverse facts	1	Using inverse facts	• relate multiplication facts to their inverse division facts • relate division facts to their inverse multiplication facts
Practising multiplication strategies	1	Multiplying 3 or more single-digit numbers using the commutative and associative properties	• apply the commutative property of multiplication • explore and apply the associative property of multiplication, eg 2 × 3 × 5 = 2 × 5 × 3 = 10 × 3 = 30
Multiplying 2-digit numbers by a 1-digit number	1	Representing and multiplying a 2-digit number by a 1-digit number using place value understanding and the distributive law	• represent and use place value to solve a multiplication fact, eg multiplying the tens and then the units, eg 7 × 19: 7 tens + 7 nines is 70 + 63, which is 133 • explain and justify the use of the strategy
	2	Multiplying a 2-digit number by a 1-digit number using an area model	• use area model to solve multiplication problems • explain and justify the use of the strategy
	3	Representing and multiplying a 2-digit number by a 1-digit number using doubling and related facts	• represent and use doubling to multiply a 2-digit and 1-digit number, eg 41 × 6 is 41 × 3, which is 123, and then double to obtain 246 • explain and justify the use of the strategy

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA156 Develop efficient mental and written strategies and use appropriate digital technologies for multiplication and for division where there is no remainder			
Quest: Mult and div strategies, no remainder			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Multiplying 2-digit numbers using doubling	1	Representing and multiplying a 2-digit number by a 2, 4 or 8 using doubling and repeated doubling	• represent and use repeated doubling as a strategy to multiply, eg 23 × 2 is double 23, 23 × 4 is double 23 and double again, 23 × 8 is double 23, double again and double again • explain and justify the use of the strategy
Multiplying 2-digits using factorising	1	Representing and multiplying a 2-digit number by a 1-digit number using factorising (the associative property)	• represent and use factorising (factorise the larger number), eg 18 × 4 = 9 × 2 × 4 = 9 × 8 = 72 • explain and justify the use of the strategy
Selecting effective multiplication strategies	1	Selecting efficient strategies to solve multiplication problems	• select and use a variety of mental and informal written strategies to solve multiplication problems • apply the inverse relationship of multiplication and division to justify answers • check the answer to a word problem using digital technologies • record mental strategies accurately
Comparisons using the language of multiplication	1	Describing comparisons using the language of multiplication	• describe comparisons using the language of multiplication, eg 35 = 5 x 7 as 35 is 5 times as many as 7 and 7 times as many as 5
Dividing a 2-digit number by a 1 digit number	1	Dividing a 2-digit number by a 1-digit number using the inverse relationship of multiplication and division (no remainders)	• divide a 2-digit number by a 1-digit number using the inverse relationship of multiplication and division, eg 63 ÷ 9 = 7 because 7 × 9 = 63
	2	Dividing a 2-digit number by a 1-digit number using halving and repeated halving (no remainders)	• use halve to divide by 2 • use halve, halve to divide by 4 • use halve, halve, halve to divide by 8
	3	Dividing a 2-digit number by a 1-digit number using related facts (no remainders)	• use related facts to divide a 2-digit number by a 1-digit number, eg to divide by 5, first divide by 10 and then multiply by 2

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Number and Algebra

Fractions and decimals

VCMNA157 Investigate equivalent fractions used in contexts			
Quest: Equivalent fractions			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Investigating equivalent fractions	1	Investigating simple equivalent fractions less than 1 using concrete materials and/or models (denominators 2, 3, 4, 5, 6, 8, 10)	• use models such as number lines, fraction strips, fraction walls to identify equivalent fractions • use concrete materials or models to show equivalent fractions, eg folding a strip of paper
	2	Investigating equivalent fractions up to and including 1 whole using area models (denominators 2, 4 and 8; 3 and 6; 5 and 10 and 100)	• model, compare and represent the equivalence of fractions with related denominators by rediviging the whole, * using identical area models fraction walls and bar models
VCMNA158 Count by quarters, halves and thirds, including with mixed numerals. Locate and represent these fractions on a number line			
Quest: Counting in fractions			
Counting in halves and quarters	1	Counting up to 10 in halves and quarters (symbols used)	• count up to 10 from any starting point in halves and quarters • use the number line to count with halves and quarters
Counting in thirds	1	Counting in thirds on a number line up to 1	• represent fractions on a number line (in simple cases, eg identify 2/3 on a number line that already shows divisions in thirds)
	2	Counting in thirds on a number line up to 3	• count in proper and improper fractions on a number line • identify whole number equivalence 3/3 = 1, 6/3 = 2
Using mixed numbers on a number line	1	Counting and representing mixed numerals on a number line up to 3 (thirds)	• count in mixed numerals on a number line up to 3 • locate and represent mixed numerals on a number line, including on a partially-completed number line

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Number and Algebra

Fractions and decimals

VCMNA159 Recognise that the place value system can be extended to tenths and hundredths. Make connections between fractions and decimal notation 4430464			
Quest: Place value: counting in tenths/hundredths			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Using decimal tenths	1	Introducing decimal notation	• identify decimal fractions in everyday use • understand that the decimal point is a mark that identifies the ones place, and indicates the change from whole numbers to parts of a whole • read decimal fractions correctly, ie 'six point nine' • understand that any numbers after the decimal point represent part of a whole
	2	Introducing decimal tenths	• recognise that the place value system can be extended to tenths • represent tenths using concrete materials and written representations • recognise that tenths arise from dividing an object into 10 equal parts • recognise that tenths arise from dividing a one-digit number or quantity by 10 • identify decimals on a number line • represent decimals using models and place value equipment such as base ten and arrow cards, place value grid, hundred square
	3	Comparing and ordering decimal tenths	• compare and order tenths using >, < and =
	4	Counting in decimal tenths	• count forwards and backwards by tenths from any decimal number expressed to 1 decimal place, using concrete * materials and number lines, eg use base ten materials to represent 3.7 and count forward: 3.8, 3.9, 4.0, 4.1, ...
Using decimal hundredths	1	Introducing decimal hundredths	• recognise that the place value system can be extended to tenths and hundredths • recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10 • state the place value of digits in decimal numbers of up to 2 decimal places • read decimal fractions correctly, ie 'six point one nine' rather than 'six point nineteen'
	2	Counting in decimal hundredths	• count forwards and backwards by hundredths from any decimal number expressed to 2 decimal place, using concrete materials and number lines
	3	Modelling and representing decimal fractions up to 2 decimal places	• model decimal fractions using concrete materials • represent decimal fractions, eg as fractions (tenths and hundredths), on number lines, using hundreds grids, in place value models and charts
	4	Comparing and ordering decimal hundredths	• compare numbers with the same number of decimal places up to 2 decimal places
		Comparing decimal fractions up to 2 decimal places	• compare numbers with a different number of decimal places up to 2 decimal places using >, < and =
	5	Connecting decimal fractions to common fractions involving hundredths	• understand the relationship between decimal fractions and common fractions involving hundredths

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Number and Algebra

Fractions and decimals

VCMNA159 Recognise that the place value system can be extended to tenths and hundredths. Make connections between fractions and decimal notation			
Quest: Place value: counting in tenths/hundredths			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Partitioning decimal hundredths	1	Partitioning decimal hundredths less than 1	• use place value to partition decimals of up to 2 decimal places, eg 5.37 = 5 + 3/10 + 7/100 • use place value charts and expanders to link decimal fractions to place value, eg base 10 blocks, hundreds grids
	2	Partitioning decimal hundredths more than 1	• partition decimals of up to 2 decimal places in non-standard forms, eg 5.37 = 5 + 37/100 • use place value charts and expanders to link decimal fractions to place value, eg base 10 blocks, hundreds grids
Connecting decimal fractions and common fractions	1	Connecting decimal fractions to common fractions involving tenths	• understand the relationship between decimal fractions and common fractions involving tenths • recognise and apply decimal notation to express whole numbers and tenths as decimals, eg 0.1 is the same as 1/10 • investigate equivalences using various methods, eg use a number line or a calculator to show that 1/2 is the same as 0.5 and 5/10
	2	Connecting decimal fractions to common fractions involving tenths and hundredths	• understand the relationship between decimal fractions and common fractions involving tenths and hundredths • recognise and apply decimal notation to express whole numbers, tenths and hundredths as decimals, eg 0.1 is the same as 1/10 • investigate equivalences using various methods, eg use a number line or a calculator to show that 1/2 is the same as 0.5 and 5/10
	3	Connecting decimal fractions to common fractions involving halves, fifths, tenths and hundredths	• understand the relationship between decimal fractions and common fractions involving halves, fifths, tenths and hundredths
	4	Connecting decimal fractions to common fractions	• understand the relationship between decimal fractions and common fractions

Money and financial mathematics

VCMNA160 Solve problems involving purchases and the calculation of change to the nearest five cents with and without digital technologies			
Quest: Solving money problems			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Addition and subtraction money problems	1	Using decimals to represent money	• recognise that 1 cent is one-hundredth of a dollar and connect decimal notation to money values in dollars and cents • calculate the total value of a group of notes and coins and record this value using decimal notation and the symbol $ • combine amounts of notes and coins to make a given amount of money in decimal notation • use the symbols $ and c correctly when recording amounts of money
	2	Using money: Addition and subtraction problems	• use addition and subtraction to solve a variety of problems involving purchases of two or more items, including calculating change, and record the value using a decimal point and the symbol $ • use estimation to check the reasonableness of solutions to problems involving purchases and calculation of change

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Number and Algebra

Patterns and algebra

Learning Journey	Steps	Spine Nodes	Subnodes
VCMNA161 Explore and describe number patterns resulting from performing multiplication			
Quest: Exploring number patterns			
Exploring number patterns	1	Exploring number patterns resulting from performing multiplication	• find a higher term in a number pattern resulting from performing multiplication, given the first few terms, eg determine the next term in the pattern 4, 8, 16, 32, 64, ... • describe how the next term in a number pattern is calculated, eg 'Each term in the pattern is double the previous term' • find missing terms in a number sequence
VCMNA162 Solve word problems by using number sentences involving multiplication or division where there is no remainder			
Quest: Multiplication & division: word problems			
Expressing equations as word problems	1	Expressing given one-step word problems as a multiplication or division number sentences and solving	• represent and solve multiplication and division word problems (up to 10 x 10 multiplication ad division facts) using number sentences with a symbol for the unknown, eg 'Anne spent $28 dollars on tickets to a show for her friends. If 7 friends are coming to the show, what was the cost of each ticket?' • discuss whether it is more appropriate to represent the problem using x or ÷ in order to calculate the solution
	2	Expressing given one-step equations as word problems	• express given addition or subtraction equations as word problems (up to 2 digit with 2-digit addition or subtraction) • express given multiplication or division equations as word problems (using multiplication facts up to 10 x 10)
Mult/div: Solving word problems	1	Solving two-step multiplication and/or division word problems, including correspondence problems	• solve two-step word problems in context involving multiplication and division; choose the appropriate operation
	2	Solving multi-step multiplication and/or division word problems	• solve multi-step word problems involving multiplication and division represent unknown with a letter
	3	Selecting efficient strategies to solve division problems	• select and use a variety of mental and informal written strategies to solve division problems • apply the inverse relationship of multiplication and division to justify answers • check the answer to a word problem using digital technologies • record mental strategies accurately
VCMNA163 Use equivalent number sentences involving addition and subtraction to find unknown quantities			
Quest: Addition & subtraction: number sentences			
Using number sentences to find unknown quantities	1	Using inverse operations to complete addition and/or subtraction number sentences (2-digit numbers)	• complete number sentences involving addition and subtraction by calculating missing numbers, eg find the missing numbers: □ + 55 = 83, □ − 15 = 19 • use inverse operations to complete number sentences • justify solutions when completing number sentences
	2	Finding missing numbers where there are addition and/or subtraction operations on both sides of the equals sign	• find the missing number in a number sentence involving operations of addition or subtraction on both sides of the equals sign, eg 8+□=6+7

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Using units of measurement

VCMMG165 Use scaled instruments to measure and compare lengths, masses, capacities and temperatures			
Quest: Length, mass, capacity and temperature			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Metric units of length	1	Using scaled instruments to measure length	• select and use an appropriate device to measure lengths and check accuracy of estimations • explain why 2 students may obtain different measures for the same length
	2	Selecting appropriate units of measurement: metres, centimetres, millimetres	• explore the appropriateness of units when measuring length • select and justify the most appropriate metric unit to measure given lengths and distances
	3	Converting between metres and centimetres (whole numbers only)	• describe 1 m as 100 cm • convert between metres and centimetres using whole numbers, eg 3 m is the same as 300 cm • record measurement equivalents in a table • explain the relationship between the size of a unit and the number of units needed
	4	Converting between centimetres and millimetres (whole numbers only)	• describe 1 m as 100 cm • convert between metres and centimetres using whole numbers, eg 3 m is the same as 300 cm • record measurement equivalents in a table • explain the relationship between the size of a unit and the number of units needed
Length and 3D objects	1	Applying length to attributes of three-dimensional objects	• recognise the features of a three-dimensional object associated with length that can be measured • describe the length, height and width of a three-dimensional object
Introducing perimeter	1	Introducing perimeter	• use the term 'perimeter' to describe the total distance around a two-dimensional shape • estimate and measure the perimeters of two-dimensional shapes • describe when a perimeter measurement might be used in everyday situations
Temperature	1	Using the language of temperature	• identify benchmarks for freezing, cold, cool, warm, hot and boiling temperatures (water) • identify benchmarks for cold, cool, warm and hot temperatures (air)
	2	Introducing thermometers	• estimate temperature using personal reference • use a standard thermometer to determine whether temperature is rising or falling • relate thermometers to the number line • introduce the unit of degrees to record temperatures • recognise and read temperatures in everyday situations, eg weather report, cooking
	3	Measuring temperature	• recognise the need for formal units to measure temperature • use a thermometer to measure and compare temperatures to the nearest degree Celsius • record temperatures to the nearest degree Celsius using the symbol for degrees (°) • use a digital or analogue thermometer to take and record daily temperature readings

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Using units of measurement

VCMMG165 Use scaled instruments to measure and compare lengths, masses, capacities and temperatures			
Quest: Length, mass, capacity and temperature			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Measuring capacity in millilitres	1	Introducing standard measurements in millilitres	• know that a standard cup is 250 ml and a standard teaspoon is 5 ml • recognise standard measurements in everyday contexts such as cooking
	2	Introducing formal units for volume and capacity: millilitres	• recognise the need for a formal unit smaller than the litre to measure volume and capacity • recognise that there are 1000 millilitres in 1 litre, ie 1000 millilitres = 1 litre • relate the millilitre to familiar everyday containers and familiar informal units, eg 250 mL fruit juice containers, 1 teaspoon is approximately 5 mL
	3	Reading scales with 100 millilitre markings	• read a scale where every 100 ml is marked and labelled • read a scale where every 100 ml is marked and half and I litre are labelled • read a scale where every 100 ml is marked and every other 100 ml is labelled
	4	Measuring with millilitres to the nearest 100 ml	• use the millilitre as a unit to measure volume and capacity, using a device calibrated in millilitres (read to the nearest 100ml with every 100ml or every other 100ml marked) • record volumes and capacities using the abbreviation for millilitres (mL) • estimate the capacity of a container in millilitres and check by measuring (measure to the nearest 100ml with every 100ml or every other 100ml marked) • compare and order the capacities of 2 or more containers measured in millilitres
Measuring mass in grams and kilograms	1	Investigating mass in packaging	• interpret information about mass on commercial packaging • estimate the mass of a substance in a partially-filled container/packet from the information on the label
	2	Introducing formal units for mass: the gram	• establish the need for a smaller unit of mass and introduce the gram, including that 1000 grams = 1 kilogram • develop a sense of the mass of standard everyday objects in grams, eg an egg is about 50 grams • identify everyday situations where grams are an appropriate unit for measuring the mass • introduce the abbreviation 'g' for recording mass in grams and record masses • calculate the number of grams in a whole number of kilograms • interpret simple fractions (¼, ½, ¾) of a kilogram and relate these to the number of grams
	3	Measuring in grams	• estimate mass using personal references for grams and 'guess and check' • measure mass in grams by using and interpreting varied scales and images of scales • record mass in grams using the appropriate abbreviation (g)
	4	Measuring in grams and kilograms	• estimate mass using personal references for grams and kilograms • choose appropriate standard units to estimate and measure (g/kg) • measure mass in grams and kilograms by using and interpreting varied scales • record mass in grams, kilograms and mixed units using the appropriate abbreviations (g), (kg), eg 5 kg and 500 g

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Using units of measurement

VCMMG166 Compare objects using familiar metric units of area and volume			
Quest: Area and volume			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Comparing area using metric units	1	Comparing and ordering rectangular areas using counting of standard metric units	• compare two areas by measuring using standard metric units • order three or more areas by measuring using standard metric units • choose the most appropriate unit cm2 or m2 and justify selection
Using cubic cm to measure volume	1	Using unit cubes to measure volume	• measure volumes by counting unit cubes, using cubic centimetres, cubic inches, cubic feet and improvised units
	2	Estimating and measuring volume using cubic centimetre blocks	• use the cubic centimetre as a unit to measure volumes by packing small containers with cubic-centimetre blocks and describing in terms of layers, eg '2 layers of 10 cubic-centimetre blocks • construct three-dimensional objects using cubic-centimetre blocks and count the blocks to determine the volumes of the objects; devise and explain strategies for counting blocks • compare the volumes of 2 or more objects made from cubic-centimetre blocks by counting blocks record volumes using the abbreviation for cubic centimetres (cm^3)
	3	Using cubic centimetres to measure volume	• measure the volumes of rectangular containers by packing them with cubic-centimetre blocks • explain the advantages and disadvantages of using cubic-centimetre blocks as a unit to measure volume • describe arrangements of cubic-centimetre blocks in containers in terms of layers • connect the layers of blocks with multiplying the dimensions
VCMMG167 Convert between units of time			
Quest: Converting units of time			
Converting units of time	1	Converting between units of time (multiplicative conversions only)	• calculate the number of seconds in a whole number of minutes • calculate the number of minutes in a whole number of hours • calculate the number of days in a whole number of weeks • calculate the number of months in a whole number of years • solve problems involving conversion between units of time
VCMMG168 Use am and pm notation and solve simple time problems			
Quest: AM/PM and elapsed time			
AM/PM and elapsed time problems	1	Using am and pm notation	• know that there are 24 hours in a day • recognise that midday/noon divides the day into two equal parts of 12 hours each • establish the need to distinguish between times in the first 12 hours of the day and the second 12 hours of the day, and introduce am and pm notation • know and record midday/noon as 12 pm and 12:00 pm, and midnight as 12 am and 12:00 am • use am and pm notation to record times in relation to midday/noon and midnight • read times written using am and pm notation using 'past', 'to', morning, afternoon, evening and night appropriately', eg 3:40 pm is 'twenty to four in the afternoon'
	2	Solving problems relating to elapsed time involving the four operations (to five minutes)	• use the 4 operations to solve word problems involving intervals of time including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Shape

VCMMG169 Compare the areas of regular and irregular shapes by informal means			
Quest: Area of regular and irregular shapes			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Measuring & comparing regular and irregular shapes	1	Measuring areas of rectilinear figures by decomposing into rectangles and counting units	• recognise area as additive • decompose rectilinear figures into rectangles to find their area by tiling or using a grid overlay
	2	Estimating and comparing areas of non-rectilinear shapes using a square grid	• use a square grid to approximate and compare the areas of non-rectilinear shapes • compare how different placements of the grid make approximation easier or more difficult • find and explain the area of irregular shapes by counting squares or part squares
	3	Approximating and comparing areas of non-rectilinear shapes using a square centimetre grid	• use a square-centimetre grid to approximate and compare the areas of non-rectilinear shapes • compare how different placements of the grid make approximation easier or more difficult • find and explain the area of irregular shapes by counting squares or part squares
VCMMG170 Compare and describe two dimensional shapes that result from combining and splitting common shapes, with and without the use of digital technologies			
Quest: Composing and decomposing 2D shapes			
Composing and decomposing 2D shapes	1	Composing and decomposing two-dimensional shapes	• create two-dimensional shapes by combining and splitting common shapes • follow instructions to create a common shape using a specified set of 2 or more common shapes • describe and/or name the shape formed by combining and splitting common shapes • compare the area of combined and split shapes and their components • investigate the range of combinations that can be used to combine or split common shapes

Location and transformation

VCMMG172 Use simple scales, legends and directions to interpret information contained in basic maps			
Quest: Scales, legends and directions			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Using legends and cardinal compass directions	1	Using legends on maps	• establish the need for legends on maps with and without grid referencing • use the legend of a map to determine the feature located at a given grid reference • use the legend of a map to determine the grid reference for a given feature
	2	Introducing cardinal compass directions	• understand, locate and label the 4 cardinal compass directions on a compass rose: north (N), south (S), east (E) and west (W) • connect the 4 cardinal compass directions to features of the local area from their particular location • determine the direction of other cardinal compass directions when given one of the cardinal compass directions

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Understanding Practice and Fluency (UPF)

Measurement and Geometry

Location and transformation

VCMMG172 Use simple scales, legends and directions to interpret information contained in basic maps			
Quest: Scales, legends and directions			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Using legends and cardinal compass directions	3	Describing locations on maps using cardinal compass directions	• recognise that north (N) is typically represented by an arrow on a map • use the 4 cardinal compass directions to describe the location of one feature in relation to another on a map that has an arrow representing north
	4	Following and giving cardinal compass directions	• follow a sequence of 2 or more directions to find a location within a safe zone of the school • give a sequence of 2 or more directions for a another person to find a location within a safe zone of the school
	5	Drawing routes on maps using cardinal compass directions	• draw a route on a map given a sequence of directions involving cardinal directions and landmarks • use cardinal directions and landmarks to describe a route between 2 locations on a map
Solving measurement problems	1	Using multiplication and division to solve measurement and scaling problems (within 100)	• solve simple rates problems using multiplication and division (within 100), eg 'Teesha made 3 cards in 1 hour. How many cards can she make in 3 hours? • write equations using a symbol, eg a box or a blank, to represent the unknown number compare their own and others' methods of solution
VCMMG173 Create symmetrical patterns, pictures and shapes with and without digital technologies			
Quest: Symmetrical patterns, pictures and shapes			
Introducing transformations	1	Introducing transformations: Slides (translations)	• describe the process of performing a 'slide' and the similarities and differences between the original shape and the shape after it has undergone a 'slide' • identify and describe a one-step slide of a shape using the term 'slide' • perform a one-step slide of a shape using physical materials and record the result without the use of digital technology • perform a one-step slide of a shape and record the result using digital technolog • predict and draw the result of a one-step slide on a given shape
	2	Introducing transformations: Flips (reflections)	• describe the process of performing a 'flip' and the similarities and differences between the original shape and the shape after it has undergone a 'flip' • identify and describe a one-step flip of a shape using the term 'flip' • perform a one-step flip of a shape using physical materials and record the result without the use of digital technology • perform a one-step flip of a shape and record the result using digital technolog • predict and draw the result of a one-step flip on a given shape
	3	Introducing transformations: Turns (rotations)	• describe the process of performing a 'turn' and the similarities and differences between the original shape and the shape after it has undergone a 'turn' about a centre of rotation • recognise and describe turns as 'clockwise' or 'anti-clockwise' • identify and describe one-step quarter turns, half turns and three-quarter turns of a shape using the terms 'quarter turn', 'half turn', 'three-quarter turn' • perform one-step quarter turns, half turns and three-quarter turns of shapes using physical materials and record the results without the use of digital technology • perform one-step quarter turns, half turns and three-quarter turns of a shape and perform a one-step flip of a shape, recording the results using digital technology • predict and draw the result of one-step quarter turns, half turns and three-quarter turns on a given shape • explore and describe the number of half turns and quarter turns required for a full-turn

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Location and transformation

VCMMG173 Create symmetrical patterns, pictures and shapes with and without digital technologies			
Quest: Symmetrical patterns, pictures and shapes			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Creating and drawing summertical designs	1	Creating and drawing symmetrical designs and shapes	• create symmetrical designs using physical materials • create symmetrical shapes using physical materials • draw symmetrical designs and shapes without the use of digital technology • create symmetrical designs and shapes using digital technology
	2	Completing symmetrical designs	• complete symmetrical designs and shapes given their line of symmetry and one half of the design or shape
Recognising tessellations	1	Recognising tessellations	• recognise and describe transformations in tessellating designs consisting of a single shape • create and record tessellating designs using transformations on a single shape • determine whether a shape will or will not tessellate

Geometric reasoning

VCMMG174 Compare angles and classify them as equal to, greater than or less than a right angle			
Quest: Classifying angles			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Classifying angles	2	Classifying angles in relation to a right angle	• classify angles as 'less than a right angle', 'about the same as a right angle', 'greater than a right angle'
	3	Classifying angles as acute, right or obtuse	• identify and name angles as acute, right or obtuse • categorise angles as acute, right or obtuse • draw and create angles of a given size: acute, right, obtuse (no protractors)
	4	Classifying angles as acute, right, obtuse, straight, reflex or a revolution	• understand and describe angles greater than or equal to 180° • identify and name angles as acute, right, obtuse, straight, reflex and revolution • categorise angles as acute, right, obtuse, straight, reflex and revolution • draw and create angles of a given size: acute, right, obtuse, straight, reflex and revolution (no protractors)

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Statistics and Probability

Chance

VCMSP175 Describe possible everyday events and order their chances of occurring			
Quest: Chance events			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Describing the chance of events occurring	1	Describing the chances of everyday events occurring	• use the terms 'equally likely', 'likely' and 'unlikely' to describe the chance of everyday events occurring compare the chance of familiar events occurring and describe the events as being 'more likely' or 'less likely' to occur than each other • order events from least likely to most likely to occur
	2	Describing the chances of events occurring in simple chance experiments	• compare the likelihood of obtaining particular outcomes in a simple chance experiment
VCMSP176 Identify everyday events where one cannot happen if the other happens			
Quest: Non-simultaneous everyday events			
Exploring non-simultaneous everyday events	1	Exploring everyday events that cannot occur simultaneously	• identify and discuss everyday events that cannot occur at the same time
VCMSP177 Identify events where the chance of one will not be affected by the occurrence of the other			
Quest: Independent and dependent events			
Independent and dependent events	1	Identifying events where the chances of occurring are independent of other events	• identify and discuss events where the chance of 1 event occurring will not be affected by the occurrence of the other • explain why subsequent events are independent • compare independent events with dependent events

Data representation and interpretation

VCMSP178 Select and trial methods for data collection, including survey questions and recording sheets			
Quest: Trial methods for data collection			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Surveys and sorting data	1	Creating and refining a survey	• create a survey and related recording sheet, considering the appropriate organisation of categories for data collection; predict possible responses • identify questions and issues relevant to given categorical data, matches statistical questions with given data sets; recognises statistical questions that are clearly unsuitable • choose effective ways to collect and record data for an investigation, eg creating a survey with a scale of 1 to 5 to indicate preferences • refine survey questions as necessary after a small trial • discuss and decide the most suitable question to investigate a particular matter of interest, eg by narrowing the focus of a question

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Statistics and Probability

Data representation and interpretation

VCMSP178 Select and trial methods for data collection, including survey questions and recording sheets			
Quest: Trial methods for data collection			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Surveys and sorting data	2	Conducting and evaluating a survey	• conduct a survey to collect categorical data • discuss and determine possible improvements to the questions or recording sheet • compare the effectiveness of different methods of collecting and recording data • discuss the advantages and/or disadvantages of open-ended questions in a survey, compared to questions with predetermined categories
	3	Collecting and sorting data	• plan methods of data collection (eg, surveying or questioning, when to ask, who to ask) and efficient ways of * recording data (eg, tables and tally charts); identify issues with data collection and refines the process as appropriate • recognise that data can come from other sources, eg governmental agencies, sports, environmental agencies • sort data into the correct categories; enter data into the correct cells in a table; create a table in a spreadsheet (digital recording); recognise when data has been sorted incorrectly
VCMSP179 Construct suitable data displays, with and without the use of digital technologies, from given or collected data. Include tables, column graphs and picture graphs where one picture can represent many data values			
Quest: Constructing suitable data displays			
Column graphs using many-to-one correspondence	1	Introducing column graphs with many-to-one correspondence	• determine the scale on a column graph • read and interpret data in a column graph with many-to-one correspondence • recognise and remedy errors or unsuitable scales in a column graph
	2	Representing data in column graphs using many-to-one correspondence	• represent given or collected categorical data in column graphs • discuss and determine a suitable scale of many-to-one correspondence to draw graphs for large data sets and state the key used • use grid paper to assist in drawing graphs that represent data using a scale of many-to-one correspondence • use data in a spreadsheet to create column graphs with appropriately labelled axes • mark equal spaces on axes, name and label axes, and choose appropriate titles for graphs • interpret data in column graph; ask and answer questions related to the data in the display; draw conclusions

Victorian Curriculum Year 4

Understanding Practice and Fluency (UPF)

Statistics and Probability

Data representation and interpretation

VCMSP179 Construct suitable data displays, with and without the use of digital technologies, from given or collected data. Include tables, column graphs and picture graphs where one picture can represent many data values			
Quest: Constructing suitable data displays			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Picture graphs with many-to-one correspondence	1	Introducing picture graphs with many-to-one correspondence	• interpret the key on a picture graph with many-to-one correspondence • read and interpret data in a picture graph with many-to-one correspondence • recognise and remedy errors or unsuitable scales in a picture graph
	2	Representing data in picture graphs using many-to-one correspondence	• represent given or collected categorical data in picture graphs • discuss and determine a suitable scale of many-to-one correspondence to draw graphs for large data sets and state the key used • use grid paper to assist in drawing graphs that represent data using a scale of many-to-one correspondence • mark equal spaces on axes, name and label axes, and choose appropriate titles for graphs • interpret data in a picture graph; ask and answer questions related to the data in the display; draw conclusions
VCMSP180 Evaluate the effectiveness of different displays in illustrating data features including variability			
Quest: Evaluating and comparing data dsiplays			
Evaluating and comparing data dsiplays	1	Evaluating and comparing data displays	• interpret and evaluate the effectiveness of various data displays found in media and in factual texts, where displays represent data using a scale of many-to-one correspondence • identify and discuss misleading representations of data • discuss and compare features of data displays, including considering the number and appropriateness of the categories used, eg a display with only three categories (blue, red, other) for car colour is not likely to be useful • discuss the advantages and disadvantages of different representations of the same categorical data, eg column graphs compared to picture graphs that represent data using scales of many-to-one correspondence

Victorian Curriculum Year 5

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and Place Value

VCMNA181 Identify and describe factors and multiples of whole numbers and use them to solve problems			
Quest: Multiples, factors and divisibility tests			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Multiples and Factors	1	Finding factors for whole numbers up to 100	• determine all 'factors' of a given whole number up to 100 • determine the 'highest common factor' (HCF) of 2 whole numbers
	2	Finding multiples up to 100	• determine 'multiples' of a given whole number • determine the 'lowest common multiple' (LCM) of 2 whole numbers
	3	Solving problems using factors and multiples	• solve problems using knowledge of factors and multiples, eg 'There are 48 people at a party. In how many ways can you set up the tables and chairs, so that each table seats the same number of people and there are no empty chairs?'
Divisibility Tests	1	Finding multiples up to 100	• determine 'multiples' of a given whole number • determine the 'lowest common multiple' (LCM) of 2 whole numbers
		Finding multiples up to 100	• determine 'multiples' of a given whole number • determine the 'lowest common multiple' (LCM) of 2 whole numbers
		Finding multiples up to 100	• determine 'multiples' of a given whole number • determine the 'lowest common multiple' (LCM) of 2 whole numbers
	2	Introducing divisibility tests for dividing by 4	• apply divisibility test to find multiples of 4
		Introducing divisibility tests for dividing by 8	• apply divisibility test to find multiples of 8
	3	Introducing divisibility tests for dividing by 3	• apply divisibility test to find multiples of 3
		Introducing divisibility tests for dividing by 6	• apply divisibility test to find multiples of 6
		Introducing divisibility tests for dividing by 9	• apply divisibility test to find multiples of 9
VCMNA182 Use estimation and rounding to check the reasonableness of answers to calculations			
Quest: Estimating and rounding			
Checking with estimation and rounding	1	Checking accuracy of addition and subtraction calculations	• check solutions to problems by using the inverse operation • use estimation to check the reasonableness of answers to addition and subtraction calculations
Rounding to estimate products and quotients	1	Rounding to estimate products	• estimate products by rounding
	2	Rounding to estimate quotients	• estimate quotients using rounding

Victorian Curriculum Year 5

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and Place Value

VCMNA183 Solve problems involving multiplication of large numbers by one- or two-digit numbers using efficient mental, written strategies and appropriate digital technologie			
Quest: Multiplication			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Multiplication using multiples of 10	1	Using known facts to multiply 1-digit numbers with multiples of 1000	• use known facts and place value understanding to solve multiplication problems with multiples of 1000, eg 3 x 6 = 18 so 3 x 6000 = 18 000
	2	Using known facts to multiply 1-digit numbers with multiples of 10 000	• use known facts and place value understanding to solve multiplication problems with multiples of 1000, eg 3 x 6 = 18 so 3 x 60 000 = 180 000
Mult: rounding, compensating and partitioning	1	Multiplying 1-digit and 2-digit numbers using rounding and compensating	• use known facts to solve multiplication problems by adding on or taking off, eg 5 × 100 is 500, so 5 × 99 is 5 less, which is 495
	2	Using partitioning to double or halve any number (up to 4-digits)	• use models and diagrams to support partitioning to double or halve any number (up to 4-digits), eg 58 halved as half of 50 + half of 8, or double 58 as double 50 + double 8
	3	Using compensation to double or halve any number (up to 4-digits)	• use models and diagrams to support the use of compensation to double or halve any number (up to 4-digits), eg double 398 as double 400 and subtract 4, or half of 398 as half of 400 and subtract 1
	4	Using partitioning or compensation to double or halve any number (up to 4-digits)	• use partitioning or compensation to double or halve any number (up to 4-digits)
Mult: doubling, halving and thirding	1	Multiplying using doubling	• use the relationship between multiplication facts, eg the multiplication facts for 6 are double the multiplication facts for 3
		Multiplying by 2, 4 or 8 using repeated doubling	• use doubling as a strategy to multiply by 2, eg 70 × 2 is double 70 • use double-double as a strategy to multiply by 4, eg 70 × 4 is double-double 70 which is 280 • use doubling as a strategy to multiply by 8, eg 70 × 8 is double-double-double 70 which is 560
	2	Using doubling and halving to solve multiplication problems with 2-digit and 1-digit numbers	• mentally adjust a multiplication problem by doubling one factor and halving the other, eg 24 x 6 as 12 x 12
	3	Using doubling and halving to solve multiplication problems with a 1-digit number and a 1 or 2-digit number	• mentally adjust a multiplication problem by doubling one factor and halving the other, eg 24 x 50 as 12 x 100
	4	Using doubling and halving or thirding and trebling to solve multiplication problems	• mentally adjust a multiplication problem using doubling and halving or thirding and trebling where appropriate, eg 18 x 3 as 6 x 9 or 24 x 6 as 12 x 12

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Understanding Practice and Fluency (UPF)

Number and Algebra

Number and Place Value

VCMNA183 Solve problems involving multiplication of large numbers by one- or two-digit numbers using efficient mental, written strategies and appropriate digital technologie			
Quest: Multiplication			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Multiplying using the split method	1	Multiplying 3-digit numbers by 1-digit numbers using split method	• multiply the hundreds, then the tens and then the ones
	2	Multiplying 4-digit numbers by 1-digit numbers using split method	• multiply the thousands, then the hundreds, then the tens and then the ones
Multiplying by factorising	1	Multiplying by factorising (using the distributive property)	• split factors, eg 50 × 8 is the same as 50 × 2 × 4, which becomes 100 × 4
	2	Factorising to multiply a 2-digit number by a 2-digit number	• factorise to multiply a 2-digit number by a 2-digit number, eg 12 × 25 = 3 × 4 × 25 = 3 × 100 = 300
Multiplying using an area model	1	Multiplying 3-digit numbers by 1-digit numbers using an area model	• use an area model for 3-digit by 1-digit multiplication
	2	Multiplying 4-digit numbers by 1-digit numbers using an area model	• use an area model for 4-digit by 1-digit multiplication
	3	Multiplying 2-digit numbers by 2-digit numbers using an area model	• use an area model for 2-digit by 2-digit multiplication
Multiplying using formal algorithms	1	Multiplying 2-digit numbers by 1-digit numbers using the expanded algorithm	• multiply the ones, then the tens, with and without regrouping
		Multiplying 3-digit numbers by 1-digit numbers using the expanded algorithm	• multiply the ones, then the tens, then the hundreds, with and without regrouping
		Multiplying 4-digit numbers by 1-digit numbers using the expanded algorithm	• multiply the ones, then the tens, then the hundreds and then the thousands, with and without regrouping
	2	Multiplying 2-digit numbers by 1-digit numbers using the contracted algorithm	• multiply the ones, then the tens, with and without regrouping
		Multiplying 3-digit numbers by 1-digit numbers using the contracted algorithm	• multiply the ones, then the tens, then the hundreds, with and without regrouping
		Multiplying 4-digit numbers by 1-digit numbers using the contracted algorithm	• multiply the ones, then the tens, then the hundreds and then the thousands, with and without regrouping
	3	Multiplying 2-digit numbers by 2-digit numbers using the extended form of the formal algorithm	• multiply 2-digit by 2-digit numbers using extended form, with and without regrouping
		Multiplying 3-digit numbers by 2-digit numbers using the extended form of the formal algorithm	• multiply 3-digit by 2-digit numbers using extended form, with and without regrouping

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Understanding Practice and Fluency (UPF)

Number and Algebra

Number and Place Value

VCMNA183 Solve problems involving multiplication of large numbers by one- or two-digit numbers using efficient mental, written strategies and appropriate digital technologie			
Quest: Multiplication			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Multiplication word problems	1	Solving multiplication word problems	• apply appropriate mental strategies to solve multiplication word problems • apply appropriate written strategies to solve multiplication word problems
VCMNA184 Solve problems involving division by a one digit number, including those that result in a remainder			
Quest: Division			
Division using partitioning	1	Dividing a 3-digit number by a 1-digit number using partitioning	• partition a 3-digit number to divide
Extended division - no remainders or zeros	1	Dividing a 2-digit number by a 1-digit divisor using the extended algorithm, no remainders or zeros in answers	• apply the written algorithm to divide a 2-digit number by a 1-digit number, without remainders and without zeros in the answer
	2	Dividing a 3-digit number by a 1-digit divisor using the extended algorithm, no remainders or zeros in answers	• apply the written algorithm to divide a 3-digit number by a 1-digit number, without remainders and without zeros in the answer
	3	Dividing a 4-digit number by a 1-digit divisor using the extended algorithm, no remainders or zeros in answers	• apply the written algorithm to divide a 4-digit number by a 1-digit number, without remainders and without zeros in the answer
	4	Solving problems involving division of a 2-digit number by a one-digit number, with no remainders	• recognise and use different notations to indicate division
Extended division - remainders	1	Dividing a 2-digit number by a 1-digit divisor using the extended algorithm, with remainders but without zeros in answers	• apply the written algorithm to divide a 2-digit number by a 1-digit number, with remainders but without zeros in the answer
	2	Dividing a 3-digit number by a 1-digit divisor using the extended algorithm, with remainders but without zeros in answers	• apply the written algorithm to divide a 3-digit number by a 1-digit number, with remainders but without zeros in the answer
	3	Dividing a 4-digit number by a 1-digit divisor using the extended algorithm, with remainders but without zeros in answers	• apply the written algorithm to divide a 4-digit number by a 1-digit number, with remainders but without zeros in the answer
	4	Solving problems involving division of a 2-digit number by a 1-digit number, with remainders	• record remainders as fractions and decimals

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Understanding Practice and Fluency (UPF)

Number and Algebra

Number and Place Value

VCMNA184 Solve problems involving division by a one digit number, including those that result in a remainder			
Quest: Division			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Extended division - with and without remainders	1	Dividing a 2-digit number by a 1-digit divisor using the extended algorithm, with and without remainders and zeros in answers	• apply the written algorithm to divide a 2-digit number by a 1-digit number, with and without remainders and zeros in the answer
	2	Dividing a 3-digit number by a 1-digit divisor using the extended algorithm, with and without remainders and zeros in answers	• apply the written algorithm to divide a 3-digit number by a 1-digit number, with and without remainders and zeros in the answer
	3	Dividing a 4-digit number by a 1-digit divisor using the extended algorithm, with and without remainders and zeros in answers	• apply the written algorithm to divide a 4-digit number by a 1-digit number, with and without remainders and zeros in the answer
	4	Solving problems involving the division of a number with 3 or more digits by 1 digit, with no remainder	• divide the hundreds, then the tens, and then the ones • use the formal algorithm
Contracted division - no remainders or zeros	1	Dividing a 2-digit number by a 1-digit divisor using the contracted algorithm, no remainders or zeros in answers	• apply the written algorithm to divide a 2-digit number by a 1-digit number, without remainders and without zeros in the answer
	2	Dividing a 3-digit number by a 1-digit divisor using the contracted algorithm, no remainders or zeros in answers	• apply the written algorithm to divide a 3-digit number by a 1-digit number, without remainders and without zeros in the answer
	3	Dividing a 4-digit number by a 1-digit divisor using the contracted algorithm, no remainders or zeros in answers	• apply the written algorithm to divide a 4-digit number by a 1-digit number, without remainders and without zeros in the answer
Contracted division - no remainders	1	Dividing a 2-digit number by a 1-digit divisor using the contracted algorithm, with remainders but without zeros in answers	• apply the written algorithm to divide a 2-digit number by a 1-digit number, with remainders but without zeros in the answer
	2	Dividing a 3-digit number by a 1-digit divisor using the contracted algorithm, with remainders but without zeros in answers	• apply the written algorithm to divide a 3-digit number by a 1-digit number, with remainders but without zeros in the answer
	3	Dividing a 4-digit number by a 1-digit divisor using the contracted algorithm, with remainders but without zeros in answers	• apply the written algorithm to divide a 4-digit number by a 1-digit number, with remainders but without zeros in the answer
	4	Solving problems involving the division of a number with 3 or more digits by 1 digit, with remainders	• divide the hundreds, then the tens, and then the ones • use the formal algorithm

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Understanding Practice and Fluency (UPF)

Number and Algebra

Number and Place Value

VCMNA184 Solve problems involving division by a one digit number, including those that result in a remainder			
Quest: Division			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Contracted division-with and without remainders	1	Dividing a 2-digit number by a 1-digit divisor using the contracted algorithm, with and without remainders and zeros in answers	• apply the written algorithm to divide a 2-digit number by a 1-digit number, with and without remainders and zeros in the answer
	2	Dividing a 3-digit number by a 1-digit divisor using the contracted algorithm, with and without remainders and zeros in answers	• apply the written algorithm to divide a 3-digit number by a 1-digit number, with and without remainders and zeros in the answer
	3	Dividing a 4-digit number by a 1-digit divisor using the contracted algorithm, with and without remainders and zeros in answers	• apply the written algorithm to divide a 4-digit number by a 1-digit number, with and without remainders and zeros in the answer
Division word problems	1	Solving division word problems	• divide a number with 3 or more digits by a single-digit divisor
VCMNA185 Use efficient mental and written strategies and apply appropriate digital technologies to solve problems			
Quest: Addition and subtraction			
Adding numbers of any size	1	Using a formal written algorithm for addition calculations involving numbers of any size (no carrying)	• apply algorithms to solve problems without carrying, with the same number of places and with a different number of places; include opportunities for students to write their own algorithms with digits in correct place value positions; include word problems
	2	Using a formal written algorithm for addition calculations involving numbers of any size (with carrying)	• apply algorithms to solve problems with carrying in 1 or more places, with the same number of places and with a different number of places; include opportunities for students to write their own algorithms with digits in correct place value positions; include word problems
	3	Using a formal written algorithm for addition calculations of 3 or more addends up to any size (with and without carrying)	• apply algorithms with 3 or more addends with the same number of places and with a different number of places; include opportunities for students to write their own algorithms with digits in correct place value positions; include word problems
Subtracting numbers of any size	1	Using a formal written algorithm to record subtraction calculations involving numbers of any size (without decomposing)	• apply algorithms to solve problems without trading (decomposing), with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend); include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first; include word problems

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Understanding Practice and Fluency (UPF)

Number and Algebra

Number and Place Value

VCMNA185 Use efficient mental and written strategies and apply appropriate digital technologies to solve problems			
Quest: Addition and subtraction			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Subtracting numbers of any size	2	Using a formal written algorithm to record subtraction calculations involving numbers of any size (with decomposing)	• apply algorithms to solve problems with trading (decomposing) in 1 or more places, with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend); include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first; include word problems
	3	Using equal adjustments to subtract up to 3-digit numbers	• model and solve subtraction problems using equal adjustments
Adding and subtracting numbers of any size	1	Representing addition or subtraction problems using a bar model	• use a bar model as a tool to represent an addition or subtraction problem
	2	Applying efficient strategies for addition and subtraction calculations involving numbers of any size	• add 3 or more numbers with different numbers of digits
VCMNA186 Recognise, represent and order numbers to at least hundreds of thousands			
Quest: Recognising, representing and ordering numbers			
Reading, comparing and ordering numbers	1	Reading and writing 6-digit numbers	• apply an understanding of place value to read numbers of up to 6 digits • apply an understanding of place value to write numbers of up to 6 digits
	2	Comparing two 6-digit numbers	• compare two 6-digit numbers using words and symbols <, =, >
	3	Ordering 6-digit numbers	• arrange numbers up to 6 digits in ascending and descending order
Representing numbers using place value	1	Identifying the place value of 6-digit numbers	• state the place value of digits in numbers of up to 6 digits • pose and answer questions that extend place value understanding of numbers, eg 'What happens if I rearrange the digits in the number 128 345?', 'How can I rearrange the digits to make the largest number?' • represent and describe whole numbers to 1 000 000
	2	Using place value to partition 6-digit numbers	• use place value to partition numbers of up to 6 digits, eg 672 012 is 600 000 + 70 000 + 2000 + 10 + 2
	3	Using non-standard partitioning with 6-digit numbers	• partition numbers of up to 6 digits in non-standard forms, eg 670 000 as 500 000 + 170 000

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Understanding Practice and Fluency (UPF)

Number and Algebra

Fractions and decimals

VCMNA187 Compare and order common unit fractions and locate and represent them on a number line			
Quest: Comparing/ordering common unit fractions			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Compare and order common unit fractions	1	Comparing and ordering unit fractions with different denominators using models and diagrams	• compare and order common unit fractions using models and diagrams for support • compare and order common fractions with different denominators (halves, thirds, quarters, fifths, sixths, sevenths, eighths)
	2	Comparing unit fractions with different denominators (denominators of 2, 3, 4, 5, 6, 8, 10, 12)	• model, compare and order common unit fractions • locate and represent unit fractions on a number line • compare the relative value of unit fractions by placing them on a number line between 0 and 1 • compare using <,>, =
VCMNA188 Investigate strategies to solve problems involving addition and subtraction of fractions with the same denominator			
Quest: Addition and subtraction: fractions			
Adding and subtracting proper fractions	1	Adding proper fractions with the same denominator (denominators 2, 3, 4, 5, 6, 7, 8,)	• add proper fractions with the same denominator
	2	Subtracting proper fractions with the same denominator (denominators 2, 3, 4, 5, 6, 7, 8,)	• subtract proper fractions with the same denominator
	3	Adding and subtracting proper fractions with the same denominator (denominators 2, 3, 4, 5, 6, 7, 8,)	• add and subtract proper fractions with the same denominator
	4	Adding a whole number and a proper fraction	• add a whole number and a proper fraction
	5	Subtracting a proper fraction from a whole number	• use diagrams, and mental and written strategies, to subtract a unit fraction from any whole number including 1
Add & subtract fractions - common denominators	1	Adding mixed numerals with the same denominator	• add mixed numerals with the same denominator
	2	Subtracting mixed numerals with the same denominator	• subtract mixed numerals with the same denominator
	3	Solving word problems involving both proper fractions and mixed numerals with the same denominator	• solve word problems involving adding and subtracting fractions with the same denominator

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Understanding Practice and Fluency (UPF)

Number and Algebra

Fractions and decimals

VCMNA189 Recognise that the place value system can be extended beyond hundredths			
Quest: Place value to thousandths			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Place value to thousandths	1	Introducing decimal thousandths	• express thousandths as decimals • interpret decimal notation for thousandths, eg 0.123 = 123/1000 • state the place value of digits in decimal numbers of up to 3 decimal places
	2	Partitioning decimal thousandths	• use place value to partition decimals of up to 3dp • partition decimals of up to 3d.p. in non-standard forms • partition fractions up to thousandths into decimals and fractions
VCMNA190 Compare, order and represent decimals			
Quest: Compare and order decimals			
Compare and order decimals	1	Interpreting zeros at the end of a decimal	• understand that a zero at the end of a decimal does not change its value
	2	Knowing common fraction and decimal equivalences	• know fraction and decimal equivalences for thirds, quarters, fifths and eighths
	3	Comparing and ordering decimal fractions of up to 3 decimal places	• place decimal numbers of up to 3 decimal places on a number line between 0 and 1 • compare and order decimals with 3 decimal places using >, < and = • compare and order decimals with a different number of decimal places, up to 3 decimal places

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Understanding Practice and Fluency (UPF)

Number and Algebra

Patterns and algebra

VCMNA192 Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction			
Quest: Number patterns - addition and subtraction			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Number patterns - addition and subtraction	1	Describing, continuing and creating patterns resulting from addition and subtraction including fractions	• identify, continue and create simple number patterns involving addition and subtraction including fractions • describe patterns using the terms 'increase' and 'decrease', eg 'The terms decrease by 1/4' • find missing terms in a number sequence
	2	Describing, continuing and creating patterns resulting from addition and subtraction including decimals	• identify, continue and create simple number patterns involving addition and subtraction including decimals • describe patterns using the terms 'increase' and 'decrease', eg for the pattern 4.8, 4.1, 3.4, 2.7, ..., 'The terms decrease by 0.7'
VCMNA193 Use equivalent number sentences involving multiplication and division to find unknown quantities			
Quest: Number sentences - mult and div			
Number sentences - mult and div	1	Using equivalent number sentences that involve more than 1 operation to find unknown quantities	• complete number sentences that involve more than 1 operation by calculating missing numbers, eg 5 × □ = 4 × 10, 5 × □ = 30 − 10
	2	Describing and using inverse operations to solve number sentences with whole numbers and any of the 4 operations	• identify and use inverse operations to assist with the solution of number sentences, eg 125 ÷ 5 = □ becomes □ × 5 = 125
	3	Finding the missing number in multiplication and division number sentences involving simple fractions or decimals	• complete number sentences involving multiplication and division, including those involving simple fractions or decimals, eg 7 × □ = 7.7
VCMNA194 Follow a mathematical algorithm involving branching and repetition (iteration)			
Quest: Algorithms with branching or repetition			
Using branching and repetition	1	Manipulate sets of numbers using a given rule	• follow a mathematical algorithm to adjust a given set of numbers eg if an even number, halve, if an odd number, then subtract one and halve or if a multiple of 5 divide by 5, if a multiple of 2 then halve. • compare sets of numbers with a given rule written as an algorithm and identify the rule.

Victorian Curriculum Year 5

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Using units of measurement

VCMMG195 Choose appropriate units of measurement for length, area, volume, capacity and mass			
Quest: Length, area, volume, capacity and mass			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Comparing and ordering metric lengths	1	Introducing formal units for length: kilometres	• recognise the need for a formal unit longer than the metre for measuring distance, eg distance between known places or visible landmarks • recognise that there are 1000 m in 1 km, ie 1000 m = 1 km • describe 1 m as one thousandth of a kilometre • develop a personal reference for the approximate length of 1 km and half a kilometre • record distances using the abbreviation for kilometres (km)
	2	Comparing lengths in metres and kilometres	• compare lengths and distances using metres and kilometres
		Ordering lengths in metres and kilometres	• order lengths and distances using metres and kilometres
	3	Comparing lengths in millimetres, centimetres, metres and kilometres	• compare lengths and distances using millimetres, centimetres, metres and kilometres
		Ordering lengths in millimetres, centimetres, metres and kilometres	• order lengths and distances using millimetres, centimetres, metres and kilometres
	4	Recording lengths using mixed units	• record lengths and distances using combinations of millimetres, centimetres, metres and kilometres
Selecting appropriate units for measuring	1	Introducing formal units for area: square kilometres and hectares	• measure the dimensions of a large rectangular piece of land and calculate its area in hectares, eg school playground or local park • relate one square kilometre and one hectare to known standard areas such as sports fields, courts and tracks of land • determine side lengths of different rectangles with area of one hectare, eg 200 metres by 50 metres • identify everyday situations where square kilometres or hectares are an appropriate unit for measuring the area
		Selecting and justifying appropriate metric units to measure volume and capacity (ml and l)	• select and use appropriate units to measure the capacities of a variety of containers • select and use appropriate units to estimate the volumes of a variety of objects
	2	Introducing formal units for volume: cubic metres	• recognise the need for a formal unit larger than the cubic centimetre • construct and use the cubic metre as a unit to measure larger volumes • explain why volume is measured in cubic metres in certain situations, eg wood bark, soil or concrete ; select and justify referents for cubic cm • recognise that a cubic metre can have dimensions other than a cube of side 1 metre • record volumes using the abbreviation for cubic metres (m^3) • estimate the size of a cubic metre, half a cubic metre and 2 cubic metres

Victorian Curriculum Year 5

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Using units of measurement

VCMMG195 Choose appropriate units of measurement for length, area, volume, capacity and mass			
Quest: Length, area, volume, capacity and mass			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Selecting appropriate units for measuring	3	Introducing formal units for mass: the tonne	• establish the need for formal units for very large masses and introduce tonnes, including that 1000 kg = 1 tonne • identify everyday situations where tonnes are an appropriate unit for measuring the mass • apply place value understanding to modelling, describing and recording metric units of measurement • introduce the abbreviation 't' for recording mass in tonnes and record masses using tonnes and kilograms, eg 1 t 750 kg • calculate the number of kilograms in a whole number of tonnes • interpret simple fractions (¼, ½, ¾) of a tonne and relate these to the number of kilograms
		Selecting and using the appropriate metric unit and device to measure mass	• select and use the appropriate metric unit and device to measure mass
		Recognising gross mass and net mass	• select and use the appropriate customary unit and device to measure mass
		Solving multi-step problems involving mass	• solve a variety of problems involving masses of the same unit
VCMMG196 Calculate the perimeter and area of rectangles and the volume and capacity of prisms using familiar metric units			
Quest: Perimeter, area and volume of rectangles & prisms			
Calculating perimeter of rectangles	1	Calculating the perimeters of rectangles	• explore different methods of finding the perimeter of rectangles
	2	Calculating the side length of a rectangle given the perimeter	• find the length of 1 unknown side of a rectangle given the perimeter • find possible length combinations of 2 unknown sides of a rectangle given the perimeter
Calculating the area of rectangles	1	Developing a multiplicative formula for area of a rectangle using metric units	• calculate the area of a rectangle by multiplying the length and width of the rectangle • calculate a side length of the rectangle given its area and one other side length
Volume/capacity of rectangles and prisms	1	Connecting volume and capacity	• select the appropriate unit to measure volume and capacity • demonstrate that a cube of side 10 centimetre will displace 1 litre of water • demonstrate, by using a medicine cup, that a cube of side 1 centimetre will displace 1 millilitres of water • equate 1 cubic centimetre to 1 millilitre and 1000 cubic centimetres to 1 litre • MME06VOL005e find the volumes of irregular solids in cubic centimetres using a displacement strategy

Victorian Curriculum Year 5

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Using units of measurement

VCMMG196 Calculate the perimeter and area of rectangles and the volume and capacity of prisms using familiar metric units			
Quest: Perimeter, area and volume of rectangles & prisms			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Volume/capacity of rectangles and prisms	2	Calculating the volumes of rectangular prisms using additive and multiplicative strategies	• describe rectangular prisms in terms of layers • use repeated addition to find the volumes of rectangular prisms • establish the relationship between the number of cubes in 1 layer, the number of layers, and the volume of a rectangular prism • explain that the volume of a rectangular prism can be found by finding the number of cubes in 1 layer and multiplying by the number of layers • calculate the volumes of rectangular prisms in cubic centimetres and cubic metres including calculating the volume given the net for the shape
VCMMG197 Compare 12- and 24-hour time systems and convert between them			
Quest: 24-hour time			
Using 24-hour time	1	Using 24-hour notation	• convert between 24-hour time notation and 12-hour time notation • convert between analogue and 24-hour digital clocks • record 24-hour time using necessary conventions

Shape

VCMMG198 Connect three-dimensional objects with their nets and other two-dimensional representations			
Quest: Nets			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Nets	1	Connecting three-dimensional objects with two-dimensional representations	• visualise and sketch three-dimensional objects from different views, including top, front and side views • reflect on their own drawing of a three-dimensional object and consider how it can be improved • show simple perspective in drawings by showing depth
	2	Connecting prisms and pyramids with their nets	• examine a diagram to determine whether it is or is not the net of a prism or pyramid • explain why a given net will not form a prism or pyramid • visualise and sketch nets for a given prism or pyramid • recognise whether a diagram is a net of a particular prism or pyramid • visualise and name prisms and pyramids, given diagrams of their nets • select the correct diagram of a net for a given prism or pyramid from a group of similar diagrams where the others are not valid nets of the object
	3	Connecting three-dimensional objects with their nets	• examine a diagram to determine whether it is or is not the net of a closed three-dimensional object • explain why a given net will not form a closed three-dimensional object • visualise and sketch nets for given three-dimensional objects • recognise whether a diagram is a net of a particular three-dimensional object • visualise and name prisms and pyramids, given diagrams of their nets • select the correct diagram of a net for a given prism or pyramid from a group of similar diagrams where the others are not valid nets of the object

Victorian Curriculum Year 5

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Location and transformation

VCMMG199 Use a grid reference system to describe locations. Describe routes using landmarks and directional language			
Quest: Grid reference and directional language			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Grid-referenced maps	1	Interpreting grid referenced maps	• establish that grid referencing on maps allows for more accurate description of features/locations • understand the structure (letter then number, horizontal then vertical) and meaning of grid references (everything in that grid square) • use grid references to describe features/locations on maps • identify features/locations on maps given their gird reference
	2	Creating grid referenced maps	• draw grid referenced maps of familiar locations such as the classroom, school or local area • use technology to create grid referenced maps of familiar locations such as the classroom, school or local area
	3	Drawing pathways on grid referenced maps	• draw a path from 1 feature to another on a grid referenced map given the grid reference of each feature • use grid references to describe a path from 1 feature to another on a grid referenced map
Using landmarks and directional language	1	Introducing intercardinal compass directions	• understand, locate and label the 4 intercardinal compass directions on a compass rose: north-east (NE), south-east (SE), south-west (SW) and north-west (NW) • connect the 4 intercardinal compass directions to features of the local area from their particular location • determine the direction of other cardinal and intercardinal compass directions when given one of the cardinal or intercardinal compass directions
	2	Describing locations on maps using cardinal and intercardinal compass directions	• use the cardinal and intercardinal compass directions to describe the location of one feature in relation to another on a map that has an arrow representing north
	3	Following and giving directions involving cardinal and intercardinal compass directions	• follow a sequence of 2 or more directions to find a location within a safe zone of the school • give a sequence of 2 or more directions for a another person to find a location within a safe zone of the school
	4	Drawing routes on maps using cardinal and intercardinal compass directions	• draw a route on a map given a sequence of directions involving cardinal and intercardinal directions, and landmarks • use cardinal and intercardinal directions, and landmarks, to describe a route between 2 locations on a map

Victorian Curriculum Year 5

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Location and transformation

VCMMG200 Describe translations, reflections and rotations of two-dimensional shapes. Identify line and rotational symmetries			
Quest: Transformations and symmetry			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Rigid transformations	1	Defining transformations: One-step translations, reflections and rotations	• define translations, reflections and rotations of shapes and describe the similarities and differences between the original shape and the transformed shape • identify the one-step transformation used to move a shape from 1 position to another
Symmetry	1	Drawing lines of symmetry on given designs and shapes	• recognise that some designs and shapes may have more than 1 line of symmetry • identify and draw all lines of symmetry on designs and shapes • determine the total number of lines of symmetry on designs and shapes • determine whether or not a given line through designs and shapes is a line of symmetry
	2	Recognising rotational symmetry in shapes and designs	• establish and define that rotational symmetry occurs when a shape looks identical to the original after being turned less than a full turn • determine whether or not given shapes and designs have rotational symmetry • sort shapes according to whether they are rotationally symmetrical or not
	3	Ordering of rotational symmetry	• define the order of rotational symmetry as the number of times the shape looks identical to the original as it rotates around the centre of symmetry • determine the order of rotational symmetry for given shapes and designs • compare order of rotational symmetry for odd and even sided regular polygons
VCMMG201 Apply the enlargement transformation to familiar two dimensional shapes and explore the properties of the resulting image compared with the original			
Quest: Enlarging 2D shapes			
Enlarging 2D shapes	1	Enlarging 2D shapes	• enlarge a simple 2D shape using a centre of enlargement and a simple scale factor, eg 2, 3, 4, 5, 10 • recognise the simple scale factor used in an enlargement of a 2D shape.

Victorian Curriculum Year 5

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Geometric reasoning

VCMMG202 Estimate, measure and compare angles using degrees. Construct angles using a protractor			
Quest: Angles			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Identifying and measuring angles	1	Identifying hidden angles	• identify angles in everyday situations where one arm of the angle is not visible , eg the angle of the door to the frame where one arm is the imaginary line across the bottom of the doorway • identify angles in everyday situations where both arms are not visible, eg a ball rebounding on a billiard table
	2	Introducing formal units for measuring angles	• establish the need for a formal unit to measure angles and introduce the degree and its symbol (°)
	3	Measuring and estimating angles of up to 180° in degrees	• measure angles of up to 180° using a protractor • estimate angles of up to 180° and check by measuring • measure angles of up to 360° using a protractor • estimate angles of up to 360° and check by measuring
Classifying and constructing angles	1	Classifying angles by their size in degrees	• connect the term 'right angle' with 90°, 'straight angle' with 180° and 'angle of revolution' with 360° • establish and recall the angle size in degrees for each of the classifications: acute, obtuse and reflex • classify angles with a specified size in degrees as acute, right, obtuse, straight, reflex or a revolution • draw angles that are acute, right, obtuse, straight, reflex or a revolution using a ruler only
	2	Constructing angles	• sketch angles of a specified size up to 360° • use a protractor to construct angles of up to 360° accurately

Victorian Curriculum Year 5

Understanding Practice and Fluency (UPF)

Statistics and Probability

Chance

VCMSP203 List outcomes of chance experiments involving equally likely outcomes and represent probabilities of those outcomes using fractions			
Quest: Outcomes of chance experiments			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Outcomes of chance experiments	1	Investigating equally likely outcomes of chance experiments	• recognise that outcomes are described as 'equally likely' when any one outcome has the same chance of occurring as any other outcome • list all outcomes in chance experiments where each outcome is equally likely to occur • use the term 'probability' to describe the numerical value that represents the likelihood of an outcome of a chance experiment • represent probabilities of outcomes of chance experiments using fractions • determine the likelihood of winning simple games by considering the number of possible outcomes
	2	Describing the chances of simple events occurring using familiar language and numeric benchmarks	• create, order, describe and explain the likelihood of simple events using the language of probability and numeric benchmarks of 0, 1/2 and 1
VCMSP204 Recognise that probabilities range from 0 to 1			
Quest: Probability			
Probabilities from 0 to 1	1	Ordering chance outcomes in a probabilities range from 0 to 1	• establish that the sum of the probabilities of the outcomes of any chance experiment is equal to 1 • understand that the probability ranges cannot be less than 0 and greater than 1 • order commonly used chance words on an interval from zero ('impossible') to one ('certain') • describe events that are impossible and events that are certain • describe the likelihood of a variety of events as being more or less than a half (or 0.5) and order the events on an interval

Victorian Curriculum Year 5

Understanding Practice and Fluency (UPF)

Statistics and Probability

Data representation and interpretation

VCMSP205 Pose questions and collect categorical or numerical data by observation or survey			
Quest: Outcomes of chance experiments			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Categorical and numerical data	1	Conducting surveys to obtain category and numerical data	• pose and refine questions to construct a survey to obtain categorical and numerical data about a matter of interes • collect categorical and numerical data through observation or by conducting surveys • sort category and numerical data and display in a table
	2	Conducting a statistical investigation using discrete or continuous data	• ask and investigate statistical questions that may require sampling; demonstrate an understanding that sets of data may be samples of a larger population • distinguish between discrete data and continuous data • collect data by conducting a survey or an experiment to do with themselves, their environment, issues in their school or community, or content from another subject, and record observations or measurements • organise discrete or continuous data and display the data in charts, tables, and graphs that have appropriate titles, labels and scales that suit the range and distribution of the data
VCMSP206 Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies			
Quest: Constructing data displays			
Constructing data displays	1	Constructing a line graph using a scale of many-to-one correspondence	• construct a line graph using a scale of many-to-one correspondence, with and without the use of digital technologies • name and label the horizontal and vertical axes when constructing graphs • choose an appropriate title to describe the data represented in a data display • determine an appropriate scale of many-to-one correspondence to represent the data in a data display • mark equal spaces on the axes when constructing graphs, and use the scale to label the markers • interpret data in line graph representing primary data; ask and answer questions related to the data in the display; draw conclusions
	2	Constructing a dot plot	• represent numerical data in a dot plot • interpret data in a dot plot; ask and answer questions related to the data in the display; draw conclusions
	3	Choosing appropriate data displays	• consider the data type to determine and draw the most appropriate display(s), such as column graphs, dot plots and line graphs • discuss and justify the choice of data display used • recognise that line graphs are used to represent data that demonstrates continuous change • recognise which types of data display are most appropriate to represent categorical data

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Understanding Practice and Fluency (UPF)

Statistics and Probability

Data representation and interpretation

VCMSP207 Describe and interpret different data sets in context			
Quest: Describing and interpreting data sets			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Describing and interpreting data sets	1	Interpreting primary and secondary data in a column graph with many-to-one correspondence	• describe and interpret data presented in column graphs; ask and answer questions related to data in a column graph • determine the total number of data values represented in column graphs • identify and describe relationships that can be observed in a column graph; compare column graphs with other data displays
	2	Interpreting primary and secondary data in a line graph	• interpret line graphs using the scales on the axes • describe and interpret data presented in line graphs • identify and describe relationships that can be observed in data displays
	3	Reading and interpreting data in a dot plot	• describe and interpret data in a dot plot; ask and answer questions related to the data in the display; draw conclusions • determine the total number of data values represented in dot plots • identify and describe relationships that can be observed in data display • compare dot plots to other types of displays
	4	Interpreting data and solving problems using data in tables	• describe and interpret data presented in tables, eg maximum and minimum values; total number of responses; differences between values • identify and describe relationships; draw conclusions and ask questions

Victorian Curriculum Year 6

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

Learning Journey	Steps	Spine Nodes	Subnodes
VCMNA208 Identify and describe properties of prime, composite, square and triangular numbers			
Quest: Properties of numbers			
Square and Triangular numbers	1	Describing square numbers	• model square numbers and record each number group in numerical and diagrammatic form • explain how square numbers are created • explore square numbers using arrays, grid paper or digital technologies • recognise and explain the relationship between the name 'square' number and the way the pattern of numbers is created
	2	Describing triangular numbers	• model triangular numbers and record each number group in numerical and diagrammatic form • explore triangular numbers using arrays, grid paper or digital technologies • recognise and explain the relationship between the name 'triangular' number and the way the pattern of numbers is created • model triangular numbers using matchsticks • explain how triangular numbers are created
Prime and composite numbers	1	Introducing prime and composite numbers	• establish and define prime numbers • establish and define composite numbers • know and recall all prime numbers up to 19
	2	Identifying prime and composite numbers	• determine whether a number is prime, composite or neither • explain whether a whole number is prime, composite or neither by finding the number of factors, eg '13 has two factors (1 and 13) and therefore is prime', '21 has more than two factors (1, 3, 7, 21) and therefore is composite', '1 is neither prime nor composite as it has only one factor, itself'
VCMNA209 Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers and make estimates for these computations			
Quest: Operations with whole numbers			
Addition and subtraction word problems	1	Solving addition word problems involving numbers of any size	• select and apply efficient mental strategies to solve word problems • select and apply efficient written strategies to solve word problems • use a calculator to solve word problems • interpret words that indicate the required operation • justify the choice of strategy for a given calculation
	2	Solving subtraction word problems involving numbers of any size	• select and apply efficient mental strategies to solve word problems • select and apply efficient written strategies to solve word problems • use a calculator to solve word problems • interpret words that indicate the required operation • justify the choice of strategy for a given calculation
	3	Solving word problems requiring both addition and subtraction involving numbers of any size	• select and apply efficient mental strategies to solve word problems • select and apply efficient written strategies to solve word problems • justify the use digital technologies to solve word problems • interpret words that indicate the required operation/s • justify the choice of strategy for a given calculation

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Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA209 Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers and make estimates for these computations			
Quest: Operations with whole numbers			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Multiplying and dividing by multiples of 10	1	Multiplying any numbers by 10, 100, 1000 and their multiples	• use mental strategies to multiply by 10, 100, 1000 and their multiples
		Using mental strategies to multiply 1-digit and 2-digit numbers by multiples of 10 000	• use mental strategies to multiply 1-digit and 2-digit numbers by multiples of 10 000
	2	Dividing any numbers by 10, 100, 1000 and their multiples	• use mental strategies to divide by 10, 100, 1000 and their multiples
	3	Using known facts to solve multiplication and division problems with multiples of 10 and 100	• use known facts and place value understanding to solve multiplication problems with multiples of 10 or 100, eg 3 x 6 = 18 so 3 x 600 = 1800 • use known facts and place value understanding to solve division problems with multiples of 10 or 100, eg 18 ÷ 6 = 3 so 1800 ÷ 600 = 3 • explain and justify the use of the strategy
Selecting efficient mult/div strategies	1	Selecting efficient strategies to multiply whole numbers of up to 4 digits by 1- and 2-digit numbers	• apply mental strategies • apply efficient use of formal algorithms • use digital technologies • estimate solutions to problems and check to justify solutions
	2	Selecting efficient strategies to divide whole numbers of up to 4 digits by a 1-digit divisor	• apply mental strategies • apply efficient use of formal algorithms • use digital technologies • estimate solutions to problems and check to justify solutions
Division problems	1	Dividing using known facts	• solve division problems using known division facts and multiplicative relationships, eg 81 divided by 3 must have a quotient that is 3 times the size of 81 divided by 9 so 81 divided by 3 = 27 • explain and justify the use of the strategy
		Dividing using factorising (the distributive property)	• solve division problems by splitting factors, eg 125 ÷ 5 as (100 ÷ 5) + (25 ÷ 5)
	2	Dividing up to a 4-digit number by a 2-digit divisor using the contracted algorithm, no remainders or zeroes in the answer	• apply the written algorithm to divide up to a 4-digit number by a 2-digit number
	3	Dividing up to a 4-digit number by a 2-digit divisor using the division algorithm (extended/long)	• apply the written extended (long) algorithm to divide up to a 4-digit number by a 2-digit number, with and without remainders, with and without zeros in the answer
		Dividing up to a 4-digit number by a 2-digit divisor using the contracted algorithm, with remainders but without zeros in answers	• apply the written algorithm to divide up to a 4-digit number by a 2-digit number, with remainders and without zeros in the answer

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Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA209 Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers and make estimates for these computations			
Quest: Operations with whole numbers			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Division problems	4	Dividing up to a 4-digit number by a 2-digit divisor using the contracted algorithm, with and without remainders and zeros in answers	• apply the written algorithm to divide up to a 4-digit number by a 2-digit number, with and without remainders and zeros in the answer
Multiplication and division word problems	1	Solving word problems involving multiplication and division	• use appropriate language to compare quantities, eg 'twice as much', 'half as much' • use a table or similar organiser to record methods used to solve problems
	2	Introducing speed using metric units	• recognise symbols used to record speed in kilometres per hour • solve simple problems involving speed
VCMNA210 Investigate everyday situations that use integers. Locate and represent these numbers on a number line			
Quest: Integers			
Investigating and interpreting integers	1	Investigating integers in context	• interpret integers in everyday contexts, eg temperature • count forwards and backwards with positive and negative whole numbers, including through 0 (in context)
	2	Investigating integers	• recognise the location of negative whole numbers in relation to zero and place them on a number line • use the term 'integers' to describe positive and negative whole numbers and zero • investigate negative whole numbers and the number patterns created when counting backwards on a calculator • recognise that negative whole numbers can result from subtraction
	3	Interpreting integers in context	• use a model to interpret intervals across zero (in context)

Victorian Curriculum Year 6

Understanding Practice and Fluency (UPF)

Number and Algebra

Fractions and decimals

VCMNA211 Compare fractions with related denominators and locate and represent them on a number line			
Quest: Fractions with related denominators			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Working with fractions	1	Comparing and ordering proper fractions with different numerators and denominators (denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100)	• compare and order proper fractions using a benchmark fraction for support, eg half or quarter • record comparisons using >, < or = • recognise that comparisons are only valid when the 2 fractions refer to the same whole
	2	Recognising and finding equivalent simple fractions with related denominators using multiplicative thinking (denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100)	• develop mental strategies for generating equivalent fractions, such as multiplying or dividing the numerator and the denominator by the same number • explain or demonstrate why 2 fractions are or are not equivalent • apply knowledge of equivalent fractions to convert between units of measurement
	3	Using common factors to simplify proper fractions to their simplest form	• determine a common factor of the numerator and denominator of a fractions and use to find an equivalent fraction. Repeat until the fraction is reduced to its simplest form • write a fraction in its simplest form using the highest common factor • know that a fraction is reduced to its simplest form when the only common factor of the numerator and denominator is 1
VCMNA212 Solve problems involving addition and subtraction of fractions with the same or related denominators			
Quest: Adding and subtracting fractions			
Add & subtract fractions-related denominators	1	Adding proper fractions with related denominators and answers less than 1 whole	• add proper fractions where the denominators are related • model and represent strategies, including using diagrams and written representations • use knowledge of equivalence to simplify answers when adding fractions
	2	Adding and subtracting simple proper fractions in which 1 denominator is a multiple of another (denominators 2, 3, 4, 5, 6, 7, 8, 10, 12, 100)	• add and subtract proper fractions where 1 denominator is the same as, or a multiple of, the other • use knowledge of equivalence to simplify answers when adding and subtracting fractions
		Adding simple fractions with related denominators	• add fractions where the denominators are related • use knowledge of equivalence to simplify answers when adding fractions • where the answer is greater than 1 convert the fraction to a mixed numeral
	3	Subtracting proper fractions with related denominators and answers less than 1 whole	• subtract proper fractions where the denominators are related • model and represent strategies, including using diagrams and written representations • use knowledge of equivalence to simplify answers when subtracting fractions

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Understanding Practice and Fluency (UPF)

Number and Algebra

Fractions and decimals

VCMNA212 Solve problems involving addition and subtraction of fractions with the same or related denominators			
Quest: Adding and subtracting fractions			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Add & subtract fractions-related denominators	4	Subtracting simple fractions with related denominators	• subtract fractions where the denominators are related • use knowledge of equivalence to simplify answers when subtracting fractions • where the answer is greater than 1 convert the fraction to a mixed numeral
	5	Adding and subtracting proper fractions with related denominators and answers less than 1 whole	• add and subtract proper fractions where the denominators are related • model and represent strategies, including using diagrams and written representations • use knowledge of equivalence to simplify answers when adding and subtracting fractions
Add and subtract fractions and mixed numerals	1	Adding fractions, including mixed numerals, with related denominators	• add fractions, including mixed numerals, where the denominators are related • convert an answer that is an improper fraction to a mixed numeral • use knowledge of equivalence to simplify answers when adding fractions • recognise that improper fractions may sometimes make calculations involving mixed numerals easier
	2	Subtracting fractions, including mixed numerals, with related denominators	• subtract fractions, including mixed numerals, where the denominators are related • convert an answer that is an improper fraction to a mixed numeral • use knowledge of equivalence to simplify answers when subtracting fractions • recognise that improper fractions may sometimes make calculations involving mixed numerals easier
	3	Adding and subtracting fractions including mixed numerals, with related denominators	• add and subtract fractions where the denominators are related • use knowledge of equivalence to simplify answers when adding and subtracting fractions • where the answer is greater than 1 convert the fraction to a mixed numeral
	4	Solving word problems involving fractions and mixed numerals with the related denominators	• solve word problems involving the addition and subtraction of fractions where 1 denominator is the same as, or a multiple of, the other

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Understanding Practice and Fluency (UPF)

Number and Algebra

Fractions and decimals

VCMNA213 Find a simple fraction of a quantity where the result is a whole number, with and without digital technologies			
Quest: Finding a fraction of a quantity			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Finding a fraction of a quantity	1	Finding a simple fraction of a quantity with and without the use of digital technologies	• calculate a simple fraction of a collection/quantity, with and without the use of digital technologies • explain how unit fractions can be used in the calculation of simple fractions of collections/quantities, eg 'To calculate 3/8 of a quantity, I found 1/8 of the collection first and then multiplied by 3'
	2	Solving word problems involving non-unit fractions	• find the whole given the non-unit fraction of a set • solve word problems in different contexts, eg measurement • solve word problems involving fractions with different denominators eg 2/5 of the children have blue eyes, 2/6 have green eyes, if there are 30 children altogether how many children have brown eyes?
VCMNA214 Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers			
Quest: Adding and subtracting decimals			
Adding decimals	1	Adding decimals to 2 decimal places using mental strategies	• select and apply efficient mental strategies to solve addition problems, including compensation, bridging to 1, using place value • estimate sums • record strategies using numbers, models and diagrams • relate decimals to fractions to aid mental strategies • solve word problems using mental strategies, including problems involving measurement and money
	2	Adding decimals to 3 decimal places using mental strategies	• select and apply efficient mental strategies to solve addition problems, including compensation, bridging to 1, using place value • record strategies using numbers, models and diagrams • relate decimals to fractions to aid mental strategies • solve word problems using mental strategies, including problems involving measurement and money
	3	Adding decimals using digital technologies	• add decimals using digital technologies • use estimation and rounding to check the reasonableness of answers when adding decimals • interpret a calculator display in the context of the problem, eg 2.6 means $2.60 • solve word problems involving the addition of decimals, including those involving money and measurement
	4	Adding decimals using written method	• use a standard algorithm to add decimals with the same number of decimal places • use a standard algorithm to add decimals with a different number of decimal places • use estimation and rounding to check the reasonableness of answers when adding decimals

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Understanding Practice and Fluency (UPF)

Number and Algebra

Fractions and decimals

VCMNA214 Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers			
Quest: Adding and subtracting decimals			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Subtracting decimals	1	Subtracting decimals using mental strategies	• select and apply efficient mental strategies to solve subtraction problems, including compensation, bridging to 1, using place value • record strategies using numbers, models and diagrams • relate decimals to fractions to aid mental strategies • solve word problems using mental strategies, including problems involving measurement and money
	2	Subtracting decimals using digital technologies	• subtract decimals using digital technologies • use estimation and rounding to check the reasonableness of answers when subtracting decimals • interpret a calculator display in the context of the problem, eg 2.6 means $2.60 • solve word problems involving the subtraction of decimals, including those involving money and measurement
	3	Subtracting decimals using written method	• use a standard algorithm to subtract decimals with the same number of decimal places • use a standard algorithm to subtract decimals with a different number of decimal places • use estimation and rounding to check the reasonableness of answers when subtracting decimals
	4	Rounding decimal hundredths	• round hundredths to the nearest whole number • round hundredths to the nearest tenth
VCMNA215 Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without digital technologies			
Quest: Multiplying and dividing decimals			
Multiplying decimals	1	Multiplying decimals	• use mental strategies to multiply simple decimals by single-digit numbers, eg 3.5 × 2 • multiply decimals of up to 3 decimal places by whole numbers of up to 2 digits, with and without the use of digital technologies, eg 'I measured 3 desks. Each desk was 1.25 m in length, so the total length is 3 × 1.25 = 3.75 m' • solve word problems involving the multiplication of decimals, including those involving money • use estimation and rounding to check the reasonableness of answers when multiplying decimals
	2	Multiplying decimals using written method	• multiply decimals up to thousandths using a standard algorithm
Dividing decimals	1	Dividing whole numbers and decimals of up to 2 decimal places using mental strategies	• divide decimals by a one-digit whole number where the result is a terminating decimal, eg 5.25 ÷ 5 = 1.05 • solve word problems involving the division of decimals, including those involving money • use estimation and rounding to check the reasonableness of answers when dividing decimals
	2	Dividing decimals using written method	• divide decimals up to thousandths using a standard algorithm

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Understanding Practice and Fluency (UPF)

Number and Algebra

Fractions and decimals

VCMNA216 Multiply and divide decimals by powers of 10			
Quest: Multiplying and dividing decimals by powers of 10			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Mult/div decimals by powers of 10	1	Multiplying decimals by powers of 10	• use PV equipment to multiply decimals by 10 • recognise that the digits move one place the left • use zero as a place holder
	2	Dividing decimals by powers of 10	• use PV equipment to divide decimals by 10 • recognise that the digits move one place the right • use zero as a place holder
VCMNA217 Make connections between equivalent fractions, decimals and percentages			
Quest: Fractions, decimals, and percentages			
Representing fractions, decimals and percentages	1	Introducing percentages	• recognise that the symbol % means 'percent' • understand that 'percent' relates to 'number of parts per one hundred' • write fractions with a denominator of 100 as percentages and vice versa • model percentages with concrete materials/ drawings, eg using 10x10grid • identify real-life contexts where percentages are used • find a percent of a quantity as a rate per 100, eg 30% of a quantity means 30/100 times the quantity
	2	Representing percentages and decimals	• write decimals (< 1) to 2 decimal places as percentages • model percentages and decimals using diagrams, eg number line or 100 grid • write decimals as percentages and vice versa
	3	Representing simple fractions as percentages	• represent simple fractions as percentages and vice versa • model percentages with concrete materials/ drawings, eg using 10x10grid
		Representing common fractions as percentages	• represent common fractions as percentages and vice versa • model percentages with concrete materials/ drawings, eg using 10x10grid
Fraction, decimal and percentage equivalence	1	Investigating the relationships between fractions, decimals and percentages	• investigate using concrete materials, drawings and calculators, the relationships between decimals, percentages and fractions with denominators of 2, 4, 5, 10, 20, 25, 50 and 100 • record relationships between decimals, percentages and fractions (with denominators 2, 4, 5, 10, 20, 25, 50, 100) • demonstrate understanding using symbolic representation
	2	Representing common equivalent fractions, decimals and percentages	• recall the relationships between decimals, percentages and fractions with denominators of 2, 4, 5, 10, 20, 25, 50 and 100 • recognise fractions, decimals and percentages as different representations of the same value • interpret and explain the use of fractions, decimals and percentages in everyday contexts • relate equivalence to proportion

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Understanding Practice and Fluency (UPF)

Number and Algebra

Fractions and decimals

VCMNA217 Make connections between equivalent fractions, decimals and percentages			
Quest: Fractions, decimals, and percentages			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Fraction, decimal and percentage equivalence	3	Representing equivalent fractions, decimals and percentages	• write percentages as fractions in their simplest form • write fractions with denominators that are factors of 100 as percentages by multiplying the numerator and denominator by a common value • write fractions with denominators that are not factors of 100 as percentages by writing as a decimal first, eg using short division, then x100 to write as a percentage • write percentages as decimals and vice versa • represent equivalent fractions, decimals and percentages • select and justify the most appropriate representation of a quantity — fraction, decimal, percentage
	4	Solving problems relating to percentage and decimal equivalence	• solve problems which require knowing percentage and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5 and those fractions with a denominator or multiple of 10 or 25

Money and financial mathematics

VCMNA218 Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies			
Quest: Calculating percentages			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Calculating percentages	1	Converting common fractions to percentages using mental strategies	• use mental strategies to convert fractions to percentages
	2	Converting common fractions to percentages using a calculator	• use calculator strategies to convert fractions to percentages
	3	Calculating simple percentages	• estimate 0%, 1%, 10%, 25%, 50% and 100% of an amount including examples in context (exclude discounts), explain estimation • model 10%, 25% and 50% of an amount • calculate 10%, 25% and 50% of an amount including examples in context (exclude discounts)
	4	Calculating simple percentage discounts	• investigate and calculate percentage discounts of 10%, 25% and 50% on sale items • estimate quantities using benchmarks of 10%, 25% and 50% • calculate sale price by subtracting the proportion from the original amount • calculate common percentages of quantities • choose the most appropriate equivalent form of a percentage to aid calculation
	5	Calculating simple percentages of quantities	• equate 10% to 1/10, 25% to 1/4 and 50% to 1/2 • use mental strategies to estimate discounts of 10%, 25% and 50%, • calculate the sale price of an item after a discount of 10%, 25% and 50%, recording the strategy and result

Victorian Curriculum Year 6

Understanding Practice and Fluency (UPF)

Number and Algebra

Patterns and algebra

Learning Journey	Steps	Spine Nodes	Subnodes
VCMNA219 Continue and create sequences involving whole numbers, fractions and decimals. Describe the rule used to create the sequence			
Quest: Number sequences			
Continuing and creating number sequences	1	Continuing and creating sequences involving whole numbers, fractions and decimals	• describe the rule used to create the sequence • continue and create number patterns, with and without the use of digital technologies, using whole numbers, fractions and decimals, eg 1/4, 1/8, 1/16, ... or 1.25, 2.5, 5, ... • describe how number patterns have been created and how they can be continued • create simple shape patterns using concrete materials • find missing terms in a number sequence
VCMNA220 Explore the use of brackets and order of operations to write number sentences			
Quest: Order of operations			
Order of operations - no brackets	1	Introducing order of operations involving addition and subtraction	• solve number sentences involving addition and subtraction
	2	Introducing order of operations involving multiplication and division	• solve number sentences involving multiplication and division
	3	Introducing order of operations involving all 4 operations	• solve number sentences involving all 4 operations
Order of operations using grouping symbols	1	Introducing order of operations involving grouping symbols	• explore the use of brackets and the order of operations in number sentences • use the term 'operations' to describe collectively the processes of addition, subtraction, multiplication and division • recognise that the grouping symbols () and [] are used in number sentences to indicate operations that must be performed first • perform calculations involving grouping symbols without the use of digital technologies
	2	Applying order of operations for mixed operations and grouping symbols	• apply the order of operations to perform calculations involving mixed operations and grouping symbols • investigate whether different digital technologies apply the order of operations • recognise when grouping symbols are not necessary
	3	Introducing order of operations involving multiple grouping symbols	• explore the use of multiple brackets and the order of operations in number sentences • recognise that the grouping symbols () and [] are used in number sentences to indicate operations that must be performed first • perform calculations involving grouping symbols without the use of digital technologies
	4	Applying order of operations to real life contexts	• investigate and establish the order of operations using real-life contexts • write number sentences to represent real-life situations

Victorian Curriculum Year 6

Understanding Practice and Fluency (UPF)

Number and Algebra

Patterns and algebra

VCMNA221 Design algorithms involving branching and iteration to solve specific classes of mathematical problems			
Quest: Algorithms and flowcharts			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Design algorithms & flowcharts to solve problems	1	Designing flowcharts to solve addition and subtraction of fractions with the same and different denominators	• identify or complete a suitable flow chart for solving addition of fractions with the same denominators • identify or complete a suitable flow chart for solving subtraction of fractions with the same denominators • identify or complete a suitable flow chart for solving addition of fractions with different denominators • identify or complete a suitable flow chart for solving subtraction of fractions with different denominators
	2	Designing flowcharts to solve addition and subtraction of decimals (tenths) with and without regrouping	• identify or complete a suitable flow chart for solving addition of decimals with no regrouping • identify or complete a suitable flow chart for solving subtraction of decimals with no regrouping • identify or complete a suitable flow chart for solving addition of decimals with regrouping • identify or complete a suitable flow chart for solving subtraction of decimals with regrouping

Victorian Curriculum Year 6

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Using units of measurement

VCMMG222 Connect decimal representations to the metric system			
Quest: Connecting decimals to the metric system			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Decimal notation and the metric system	1	Recording kilometres and metres using decimal notation	• record lengths and distances using decimal notation to 3 decimal places
	2	Connecting decimal representations to the metric system	• recognise the equivalence of whole-number and decimal representations of measurements of length • interpret decimal notation for lengths and distances involving millimetres, centimetres, metres and kilometres
Decimal representation in capacity	1	Connecting decimal representations to the metric systems (to 3 decimal places)	• recognise the equivalence of whole-number and decimal representations of measurements of length • interpret decimal notation for lengths and distances involving millimetres, centimetres, metres and kilometres
Decimal representation in mass	1	Understanding decimal representation of metric measurements of mass	• connect measurements of mass with their decimal representations • recognise the equivalence of whole number and decimal representations, eg 3 kg 250 g = 3.25 kg • record mass using decimal notation of up to 3 decimal places • refer to SI units of mass
VCMMG223 Convert between common metric units of length, mass and capacity			
Quest: Converting units of length/capacity/mass			
Converting metric units of length	1	Converting between standard metric units of length to 1 decimal place	• convert between centimetres and metres and vice versa • convert between centimetres and millimetres and vice versa • convert between metres and kilometres and vice versa • convert among millimetres, centimetres, metres and kilometres
	2	Converting between common metric units of length up to 2 decimal places	• convert between metres and kilometres • convert between millimetres, centimetres and metres to compare lengths and distances
	3	Converting between common metric units of length up to 3 decimal places	• convert between metres and kilometres • convert between millimetres, centimetres and metres to compare lengths and distances
Converting metric units of capacity	1	Converting between common metric units of capacity including fractions and decimals (to 2 decimal places)	• convert between millilitres and litres using fractions eg 1 and 1/10 litres as 1100 ml or 3.8 l as 3800 ml • explain and use the relationship between the size of a unit and the number of units needed to assist in determining whether multiplication or division is required when converting between units
	2	Converting between common metric units of capacity (to 3 decimal places)	• convert between millilitres and litres • explain and use the relationship between the size of a unit and the number of units needed to assist in determining whether multiplication or division is required when converting between units

Victorian Curriculum Year 6

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Using units of measurement

VCMMG223 Convert between common metric units of length, mass and capacity			
Quest: Converting units of length/capacity/mass			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Converting metric units of mass	1	Converting between standard metric units of mass to 1 decimal place	• understand the meaning of metric prefixes, eg kilo-, centi-, milli- • convert between grams and kilograms and vice versa • convert between kilograms and tonnes and vice versa • convert among grams, kilograms and tonnes
		Converting between standard metric units of mass up to 2 decimal places	• understand the meaning of metric prefixes, eg kilo-, centi-, milli- • convert between grams and kilograms and vice versa • convert between kilograms and tonnes and vice versa • convert among grams, kilograms and tonnes
		Converting between standard metric units of mass up to 3 decimal places	• understand the meaning of metric prefixes, eg kilo-, centi-, milli- • convert between grams and kilograms and vice versa • convert between kilograms and tonnes and vice versa • convert among grams, kilograms and tonnes • solve problems using diffeent units of mass
VCMMG224 Solve problems involving the comparison of lengths and areas using appropriate units			
Quest: Length and area			
Length problems	1	Solving one-step problems involving length	• solve a variety of one-step problems involving length and perimeter, including different units of length
	2	Solving two-step problems involving length	• solve a variety of two-step problems involving length and perimeter, including different units of length
Calculating the area of triangles	1	Calculating area of a right-angled triangle without a formula	• calculate the area of right-angled triangles using the relationship that the area is half the area of a rectangle with the same base and perpendicular height • calculate the area of right-angled triangles where all three side lengths are given, using the relationship that the area is half the area of a rectangle with the same base and perpendicular height
	2	Calculating area of any triangle	• calculate the area of triangles where more dimensions than are necessary are given, using the relationship that the area is half the area of a rectangle with the same base and perpendicular height
	3	Applying the formula for the area of a rectangle	• apply the formula for area of a rectangle to find the area of rectangles given 2 side lengths measured in the same or different units • apply the formula for area of a rectangle to find the area of composite rectilinear figures, such as an L-shape, U-shape

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Understanding Practice and Fluency (UPF)

Measurement and Geometry

Using units of measurement

VCMMG225 Connect volume and capacity and their units of measurement			
Quest: Volume and capacity			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Volume and capacity	1	Connecting volume and capacity	• select the appropriate unit to measure volume and capacity • demonstrate that a cube of side 10 centimetre will displace 1 litre of water • demonstrate, by using a medicine cup, that a cube of side 1 centimetre will displace 1 millilitres of water • equate 1 cubic centimetre to 1 millilitre and 1000 cubic centimetres to 1 litre • find the volumes of irregular solids in cubic centimetres using a displacement strategy
VCMMG226 Interpret and use timetables			
Quest: Using timetables			
Using Timetables	1	Using timetables (12-hour and 24-hour time)	• use real-world timetables (12-hour and 24-hour time) to determine arrival time given the desired departure time, including when the departure time is not listed exactly in the timetable • use real-world timetables (12-hour and 24-hour time) to determine departure time given the desired arrival time, including when the arrival time is not listed exactly in the timetable • use real-world timetables (12-hour and 24-hour time) to determine the duration of a journey • solve real-world problems involving timetables

Shape

VCMMG228 Construct simple prisms and pyramids			
Quest: Constructing prisms and pyramids			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Constructing prisms and pyramids	1	Constructing simple right prisms	• create prisms using a variety of materials, eg plasticine, paper or cardboard nets, connecting cubes • create skeletal models of prisms, eg using toothpicks and modelling clay or straws and tape • connect the edges of prisms with the construction of their skeletal models • construct three-dimensional models of prisms and sketch the front, side and top views • describe to another student how to construct or draw a prism • construct three-dimensional models of prisms, given drawings of different views
	2	Constructing simple pyramids	• create pyramids using a variety of materials • create skeletal models of pyramids • connect the edges of pyramids with the construction of their skeletal models • construct three-dimensional models of pyramids and sketch the front, side and top views • describe to another student how to construct or draw a pyramid • construct three-dimensional models of pyramids, given drawings of different views

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Understanding Practice and Fluency (UPF)

Measurement and Geometry

Location and transformation

VCMMG229 Investigate the effect of combinations of transformations on simple and composite shapes, including creating tessellations, with and without the use of digital technologies			
Quest: Rigid transformations			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Rigid transformations	1	Creating patterns that result from rotating shapes	• extend and create repeating patterns that result from rotations, through investigation using a variety of tools, eg pattern blocks, dynamic geometry software, geoboards, dot paper • describe the pattern • predict the next term/s in the pattern
	2	Creating patterns that result from translations	• extend and create repeating patterns that result from translations through investigation using a variety of tools, eg pattern blocks, dynamic geometry software, dot paper • describe the patter • predict the next term/s in the pattern
	3	Identifying combinations of transformations	• classify two-dimensional figures in a hierarchy based on properties • interpret a hierarchy diagram of two-dimensional shapes and their properties • use Venn diagrams to record classifications • interpret classifications represented using Venn diagrams
VCMMG230 Introduce the Cartesian coordinate system using all four quadrants			
Quest: The Cartesian plane			
The Cartesian plane	1	Locating points on the Cartesian plane	• plot and label points, given coordinates, in all 4 quadrants of the number plane • identify and label each quadrant on a number plane • identify and record the coordinates of given points in all 4 quadrants of the number plane

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Understanding Practice and Fluency (UPF)

Measurement and Geometry

Geometric reasoning

VCMMG231 Investigate, with and without digital technologies, angles on a straight line, angles at a point and vertically opposite angles. Use results to find unknown angles			
Quest: Angle properties			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Adjacent and vertically opposite angles	1	Introducing adjacent angles	• define adjacent angles as angles that share a common arm and a common vertex and recognise the larger angle created • recognise adjacent angles as additive and calculate the size of an unknown angle given the whole and its other parts and find the size of the whole given the size of the part
	2	Exploring adjacent angles that form a right angle	• explore the relationship between angles that form a right angle • calculate an unknown angle within a right angle given the other parts
	3	Exploring adjacent angles that form a straight angle	• explore the relationship between angles that form a straight angle • calculate an unknown angle within a straight angle given the other parts
	4	Exploring adjacent angles that form an angle of revolution	• explore the relationship between angles that form an angle of revolution • calculate an unknown angle within an angle of revolution given the other parts
	5	Exploring vertically opposite angles	• explore the relationship between angles formed when 2 straight lines intersect and identify these as 'vertically opposite angles' • use the equality of vertically opposite angles to find the size of unknown angles in diagrams • use the equality of vertically opposite angles to find the size of unknown angles represented by variables in diagrams

Victorian Curriculum Year 6

Understanding Practice and Fluency (UPF)

Statistics and Probability

Chance

VCMSP232 Describe probabilities using fractions, decimals and percentages			
Quest: Probability as a Fraction, Decimal or Percent			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Probability as a Fraction, Decimal or Percent	1	Describing probability of a single event using fractions, decimals and percentages	• list the outcomes for chance experiments where the outcomes are not equally likely to occur and assign probabilities to the outcomes using fractions • use knowledge of equivalent fractions, decimals and percentages to assign probabilities to the likelihood of outcomes • explain real-life events in the context of probabilities • use the terminology 'theoretical probabilitiy' and/or 'relative frequency' as the value given by the formula: number of times named outcome (s) did happen/total number of trials
VCMSP233 Conduct chance experiments with both small and large numbers of trials using appropriate digital technologies			
Quest: Chance Experiments			
Chance Experiments	1	Using digital technologies to conduct chance experiments	• assign expected probabilities to outcomes in chance experiments with random generators, including digital simulators, and compare the expected probabilities with the observed probabilities after both small and large numbers of trials • determine and discuss the differences between the expected probabilities and the observed probabilities after both small and large numbers of trials • explain what happens to the observed probabilities as the number of trials increases
	2	Making generalisations from chance samples	• use sample results to make predictions about a larger sample • discuss whether a prediction about a larger population, from which a sample comes, would be the same if a different sample were used
VCMSP234 Compare observed frequencies across experiments with expected frequencies			
Quest: Frequency/Fairness in Chance Experiments			
Frequency/ Fairness in Chance Experiments	1	Comparing observed frequencies with expected frequencies in chance experiments	• use the term 'frequency' to describe the number of times a particular outcome occurs in a chance experimen • distinguish between the 'frequency' of an outcome and the 'probability' of an outcome in a chance experiment • record and compare the expected frequencies of outcomes of chance experiments with observed frequencies, including where the outcomes are not equally likel • explain why observed frequencies of outcomes in chance experiments may differ from expected frequencies • recognise that some random generators have outcomes that are not equally likely and discuss the effect on expected outcomes
	2	Exploring fair and unfair chance experiments	• discuss the 'fairness' of simple games involving chance • design a spinner or label a die so that a particular outcome is more likely than another and discuss the probabilities of the outcomes • list all possible outcomes using tables, lists and tree diagrams (with or without digital technology) where outcomes are not equally likely to occur • record results of chance experiments using appropriate methods

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Understanding Practice and Fluency (UPF)

Statistics and Probability

Data representation and interpretation

VCMSP235 Construct, interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables			
Quest: Interpreting, representing and comparing data			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Two-way tables	1	Introducing and interpreting bivariate data and two-way tables	• interpret data presented in two-way tables that represent two categorical variables • ask and answer comparative and relational questions related to data in a two-way table
	2	Representing bivariate data in a two-way table	• create a two-way table to organise data involving 2 categorical variables • ask and answer comparative and relational questions related to data in a two-way table
Side-by-side column graphs	1	Introducing and interpreting side-by-side column graphs	• interpret side-by-side column graphs for 2 categorical variables • ask and answer comparative and relational questions related to data in a side-by-side column graph
	2	Representing bivariate data in a side-by-side column graph	• construct a side by side column graph for two categorical variables • ask and answer comparative and relational questions related to data in a side by side column graph
Comparing & selecting bivariate data displays	1	Comparing different displays of the same data set	• interpret and compare different displays of the same data set to determine the most appropriate display for the data set • compare the effectiveness of different student-created data displays • discuss the advantages and disadvantages of different representations of the same data • explain which display is the most appropriate for interpretation of a particular data set • compare representations of the same data set in a side-by-side column graph and in a two-way table
	2	Selecting appropriate data displays	• select an appropriate type of graph to represent a set of data • graph data using technology, and justify the choice of graph from types of graphs already studied
VCMSP236 Interpret secondary data presented in digital media and elsewhere			
Quest: Interpreting and evaluating secondary data			
Interpreting and evaluating secondary data	1	Interpreting discrete and continuous secondary data	• differentiate between first-hand and second-hand data • read, interpret, and draw conclusions from secondary data presented in charts, tables, and graphs (including broken-line graphs)
	2	Interpreting secondary data	• interpret data representations found in digital media and in factual texts • interpret tables and graphs from the media and online sources • identify and describe conclusions that can be drawn from a particular representation of data

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Understanding Practice and Fluency (UPF)

Statistics and Probability

Data representation and interpretation

VCMSP236 Interpret secondary data presented in digital media and elsewhere			
Quest: Interpreting and evaluating secondary data			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Interpreting and evaluating secondary data	3	Evaluating data collection for bias and misleading information	• identify sources of possible bias in representations of data in the media by discussing various influences on data collection and representatio • determine, through investigation, how well a set of data represents a population, on the basis of the method that was used to collect the data • discuss the messages that those who created a particular data representation might have wanted to convey
	4	Evaluating data displays for bias and misleading information	• critically evaluate data representations found in digital media and related claims • identify misleading representations of data in the media • explain how different scales used on graphs can influence conclusions drawn from the data • demonstrate, through investigation, an understanding of how data from charts, tables, and graphs can be used to make inferences and convincing arguments
VCMSP237 Pose and refine questions to collect categorical or numerical data by observation or survey			
Quest: Posing and evaluating statistical questions			
Posing and evaluating statistical questions	1	Evaluating statistical questions	

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Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA238 Investigate index notation and represent whole numbers as products of powers of prime numbers			
Quest: Indices			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Introducing indices	1	Describing numbers written in 'index form' using terms such as 'base', 'power', 'index', 'exponent', 'to the power of', 'squared', 'cubed'	• describe numbers written in 'index form' using terms such as 'base', 'power', 'index', 'exponent', 'to the power of', 'squared', 'cubed' • use index notation to express powers of numbers (positive indices only)
	2	describe numbers written in 'index form' using terms such as 'base', 'power', 'index', 'exponent', 'to the power of', 'squared', 'cubed' use index notation to express powers of numbers (positive indices only)	• evaluate numbers expressed as powers of integers
	3	Evaluating expressions involving indices without using a calculator	• evaluate expressions involving indices without using a calculator • apply the order of operations to evaluate expressions involving indices
	4	Evaluating expressions involving indices using a calculator	• evaluate expressions involving indices using a calculator • apply the order of operations to evaluate expressions involving indices
	5	Using index laws to simplify equations with numerical bases	• use index laws to simplify equations with numerical bases
Divisibility, indices and factors	1	Determining and applying tests of divisibility for 2, 3, 4, 5, 6 and 10	• determine and apply tests of divisibility for 2, 3, 4, 5, 6 and 10
	2	Using index notation to express prime factors	• use factor trees to express a number as a product of its prime factors, using index notation where appropriate • use the ladder method to express a number as a product of its prime factors, using index notation where appropriate
	3	Finding the highest common factor of large numbers by first expressing the numbers as products of prime factors	• find the highest common factor of large numbers by first expressing the numbers as products of prime factors
VCMNA239 Investigate and use square roots of perfect square numbers			
Quest: Square and cube roots			
Working with square roots	1	Finding square roots of perfect square whole numbers only	• find the square roots of perfect square whole numbers up to 100
	2	Finding square roots of non-perfect squares using a calculator	• find the square roots of non-perfect squares using a calculator
	3	Determining between which 2 whole numbers lies the square root of a non-perfect square number up to 100	• determine mentally, between which 2 whole numbers lies the square root of a non-perfect square number up to 100
		Estimating the square root of non-square numbers	• estimate the square root of a non-square number up to 100 • estimate the square root of a non-square number up to 100 using a number line to estimate

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Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA239 Investigate and use square roots of perfect square numbers			
Quest: Square and cube roots			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Working with cube roots	1	Finding cube roots of perfect cube whole numbers	• find the cube roots of perfect cube whole numbers up to 125
	2	Finding cube roots of non-perfect cubes using a calculator	• find cube roots of non-perfect cubes using a calculator
	3	Determining mentally, between which 2 whole numbers lies the cube root of a non-perfect cube number up to 125	• determine mentally, between which 2 whole numbers lies the cube root of a non-perfect cube number up to 125
		Estimating the cube root of a non-perfect cube number up to 125	• estimate the cube root of a non-perfect cube number up to 125
	5	Using index laws to simplify equations with numerical bases	• use index laws to simplify equations with numerical bases
Solving problems with square and cube roots	1	Finding square roots of large perfect square whole numbers from prime factors	• find square roots of large perfect square whole numbers from prime factors
	2	Applying the order of operations to evaluate expressions involving square roots and cube roots, with and without a calculator	• apply the order of operations to evaluate expressions involving square roots and cube roots, with and without a calculator
VCMNA240 Apply the associative, commutative and distributive laws to aid mental and written computation and make estimates for these computations			
Quest: Laws of multiplication and division			
Laws of multiplication and division	1	Using factors of a number to aid mental computation involving multiplication and division	• use factors of a number to aid mental computation involving multiplication and division
	2	Showing the connection between division and multiplication, including where there is a remainder	• show the connection between division and multiplication, including where there is a remainder
	3	Applying the distributive law to aid in mental computation to expand expressions containing 2 terms within the grouping symbols	• apply the distributive law to aid in mental computation to expand expressions containing 2 terms within the grouping symbols
		Applying the commutativity law of multiplication to aid mental computation	• apply the commutativity law to aid mental computation
		Applying the associativity law of multiplication to aid in mental computation	• apply the associativity law of multiplication to aid in mental computation
	4	Applying the distributive law to aid in mental computation to expand expressions containing 3 or more terms within the grouping symbols	• apply the distributive law to aid in mental computation to expand expressions containing 3 or more terms within the grouping symbols
	5	Solving problems within a given context by applying the distributive law	• solve problems within a given context by applying the distributive law

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Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA241 Compare, order, add and subtract integers			
Quest: Working with integers			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Compare, order, add and subtract integers	1		• describe the direction and magnitude of integers when applied to the number line
	2	Comparing the relative value of integers, including recording the comparison by using the symbols < and >	• compare the relative value of integers, including recording the comparison by using the symbols and < and > including negative integers
		Ordering integers	• order integers of any size in ascending and descending order including negative numbers
	3	Understanding addition and subtraction of integers pictorially	• understand addition and subtraction of integers pictorially
		Understanding addition and subtraction of integers symbolically	• understand addition and subtraction of integers symbolically
	4	Representing addition and subtraction on a horizontal or vertical number line diagram	• represent addition and subtraction on a horizontal or vertical number line diagram
	5	Adding and subtracting negative integers	• add and subtract negative integers
Solving temperature problems	1	Measuring temperature scales	• interpret scales on thermometers to accurately read temperatures
	2	Calculating change in temperature	• calculate the difference in temperature between all ranges including between 0 and a negative or positive, both positive, both negative, 1 positive and 1 negative
	3	Solving problems within a given context involving a change in temperature	• solve problems within a given context involving a change in temperature
			• solve problems within a given context involving a change in temperature using temperature specific terminology, eg warmer
	4	Describing the difference between a given minimum and maximum temperature using terms such as 'temperature range'	• describe the difference between a given minimum and maximum temperature using terms such as 'temperature range'

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Understanding Practice and Fluency (UPF)

Number and Algebra

Real numbers

VCMNA242 Compare fractions using equivalence. Locate and represent positive and negative fractions and mixed numbers on a number line			
Quest: Expressing and comparing fractions			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Fractions: improper and proper fractions	1	Generating equivalent fractions with denominators (denominators 1–100, 1000)	• generate equivalent fractions
	2	Expressing a fraction in its simplest form	• determine the highest common factor of a pair of integers • express a fraction in its simplest form
	3	Expressing improper fractions as mixed numerals	• express improper fractions as mixed numerals that do not require simplification of the proper fraction • express improper fractions as mixed numerals that require simplification of the proper fraction
	4	Expressing mixed numerals as improper fractions	• express mixed numerals as improper fractions
Fractions: comparing and ordering	1	Comparing and ordering proper fractions	• compare and order proper fractions where the denominators are not always multiples of the same number • record comparisons using =, ≠, <, > ≤, ≥ symbols
	2	Comparing and ordering improper fractions	• compare and order improper fractions where the denominators are not always multiples of the same number • record comparisons using =, ≠, <, > ≤, ≥ symbols
	3	Comparing and ordering proper fractions, improper fractions and mixed numerals	• compare and order proper fractions, improper fractions and mixed numerals where the denominators are not always multiples of the same number • record comparisons using =, ≠, <, > ≤, ≥ symbols
	4	Placing positive and negative fractions, decimals and mixed numbers on a number line in order to compare	• place positive and negative fractions, decimals and mixed numbers on a number line in order to compare
VCMNA243 Solve problems involving addition and subtraction of fractions, including those with unrelated denominators			
Quest: Adding and subtracting fractions			
Fractions: subtracting fractions	1	Subtracting proper fractions with common denominators	• subtract proper fractions with common denominators
	2	Subtracting improper fractions with common denominators	• subtract improper fractions with common denominators • subtract improper fractions with common denominators, expressing answers as a mixed numeral
	3	Subtracting mixed numbers with common denominators	• subtract mixed numbers with common denominators
	4	Subtracting proper fractions with unlike denominators	• subtract proper fractions with unlike denominators
	5	Subtracting improper fractions with unlike denominators	• subtract improper fractions with unlike denominators
		Subtracting mixed numbers with unlike denominators	• subtract mixed numbers with unlike denominators

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Understanding Practice and Fluency (UPF)

Number and Algebra

Real numbers

VCMNA243 Solve problems involving addition and subtraction of fractions, including those with unrelated denominators			
Quest: Adding and subtracting fractions			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Fractions: adding and subtracting fractions	1	Performing addition or subtraction with fractions where fractions can be in different forms	• perform addition or subtraction with fractions where fractions can be in different forms
	2	Subtracting a fraction from an integer	• subtract a fraction from a whole number using written methods
	3	Demonstrating an understanding of adding and subtracting positive fractions and mixed numerals, with like and unlike denominators, concretely, pictorially and symbolically	• demonstrate an understanding of adding and subtracting positive fractions and mixed numerals, with like and unlike denominators, concretely, pictorially and symbolically
	4	Recognising and explaining incorrect operations with fractions	• recognise and explain incorrect operations with fractions
VCMNA244 Multiply and divide fractions and decimals using efficient written strategies and digital technologies			
Quest: Multiplying & dividing fractions & decimals			
Multiplying decimals & finding quantities	1	Multiplying decimals using a calculator	• multiply decimals using a calculator
	2	Multiplying decimals using written/ mental methods	• multiply decimals using mental/written methods
	3	Calculating decimals of quantities using a calculator	• calculate decimals of quantities using a calculator
	4	Calculating decimals of quantities using mental/written methods	• calculate decimals of quantities using mental, written and calculator methods
Multiplying decimals & finding quantities	1	Multiplying proper fractions by a whole number greater than 1	• multiply proper fractions by a whole number greater than 1
		Multiplying improper fractions by a whole number greater than 1	• multiply improper fractions by a whole number greater than 1
		Multiplying improper fractions by a whole number greater than 1, expressing answer as a mixed numeral	• multiply improper fractions, expressing answer as a mixed numeral
	2	Multiplying 2 proper fractions	• multiply 2 proper fractions using written methods
	3	Multiplying 2 improper fractions	• multiply improper fractions using written methods
		Multiplying 2 improper fractions, expressing the answer as a mixed numeral	• multiply 2 improper fractions expressing the answer as a mixed numeral
	4	Multiplying 2 mixed numerals	• multiply mixed numerals using written methods
		Multiplying mixed numerals by a whole number greater than 1	• multiply mixed numerals by a whole number greater than 1
	5	Multiplying proper fractions, improper fractions and mixed numerals using written methods	• multiply proper fractions, improper fractions and mixed numerals using written methods
		Calculating fractions of quantities using mental or written strategies	• calculate fractions of quantities using mental or written strategies

Victorian Curriculum Year 7

Understanding Practice and Fluency (UPF)

Number and Algebra

Real numbers

Learning Journey	Steps	Spine Nodes	Subnodes
VCMNA244 Multiply and divide fractions and decimals using efficient written strategies and digital technologies			
Quest: Multiplying & dividing fractions & decimals			
Dividing integers, fractions and decimals	1	Dividing positive integers by unit fractions	• divide positive integers by unit fractions
	2	Dividing fractions and decimals using a calculator	• divide fractions and decimals using a calculator
	3	Dividing decimals by powers of 10	• divide decimals by powers of 10
Dividing fractions by fractions and integers	1	Dividing a unit fraction by a positive integer	• divide unit fractions by whole numbers, eg 1/3 ÷ 2 = 1/6
	2	Dividing a positive integer by a proper fraction	• divide a positive integer by a proper fraction
		Dividing a proper fraction by a positive integer	• divide a non-unit proper fraction by a whole number (where the divisor is a factor of the numerator). Use diagrams for support • divide a non-unit proper fraction by any whole number
	3	Dividing a proper fraction by a proper fraction	• divide a proper fraction by a proper fraction
	4	Dividing a positive integer by an improper fraction	• divide a positive integer by an improper fraction and mixed numeral
		Dividing an improper fraction by a positive integer	• divide an improper fraction by a positive integer
	5	Dividing improper fractions by proper fractions and vice versa	• divide improper fractions by proper fractions and vice versa
		Dividing an improper fraction by an improper fraction	• divide an improper fraction by an improper fraction
VCMNA245 Express one quantity as a fraction of another, with and without the use of digital technologies			
Quest: Expressing one quantity as a fraction			
Expressing one quantity as a fraction	1	Expressing 1 quantity as a fraction (proper/improper/mixed) of another	• express 1 quantity as a fraction of another
	2	Expressing 1 quantity as a fraction of another (using digital technology)	• express 1 quantity as a fraction of another with the use of digital technology
VCMNA246 Round decimals to a specified number of decimal places			
Quest: Rounding decimals			
Rounding decimals	1	Rounding decimals to a specified number of decimal places (simple rounding)	• round decimals to a given number of decimal places when rounding decimals up/down to the next decimal place value
	2	Rounding decimals to a specified number of decimal places (complex rounding)	• round decimals to a given number of decimal places when rounding decimals requires places to be filled with zeroes

Victorian Curriculum Year 7

Understanding Practice and Fluency (UPF)

Number and Algebra

Real numbers

VCMNA247 Connect fractions, decimals and percentages and carry out simple conversions			
Quest: Fractions, decimals and percentages			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Converting decimals	1	Demonstrating that the decimal expansion of a rational number either repeats or terminates	• demonstrate that the decimal expansion of a rational number either repeats or terminates
	2	Converting decimals to percentages	• convert decimals with up to 2 decimal places to percentages containing whole-numbers only • convert decimals with more than 2 decimal places to percentages, writing answers as a percentage with decimal parts • convert decimals with 3-4 decimal places to percentages, writing answers in fraction form • convert decimals with 5 or more decimal places to percentages, writing answers in decimal form rounded to an appropriate degree of accuracy
Converting percentages	1	Converting percentages less than or equal to 100% into fractions	• convert percentages less than or equal to 100% into fractions
		Converting terminating percentages less than 100% into a decimal	• convert terminating percentages less than 100% into a decimal
	2	Converting percentages greater than 100% to mixed numerals	• convert percentages greater than 100% to mixed numerals
		Converting percentages greater than 100% to improper fractions	• convert percentages greater than 100% to improper fractions
		Converting terminating percentages greater than or equal to 100% into a decimal	• convert terminating percentages greater than or equal to 100% into a decimal
	3	Converting recurring percentages less than 100% into a decimal	• convert recurring percentages less than 100% into a decimal
		Converting recurring percentages greater than or equal to 100% into a decimal	• convert recurring percentages greater than or equal to 100% into a decimal
Converting fractions to decimals	1	Converting fractions to decimals using a calculator	• convert fractions to decimals using a calculator
	2	Converting fractions to terminating decimals using division	• convert unit fractions to terminating decimals using division • convert improper fractions to terminating decimals using division • convert mixed numerals to terminating decimals using division
	3	Converting fractions to recurring decimals using division	• convert fractions to recurring decimals using division • convert improper fractions to recurring decimals using division • convert mixed numerals to recurring decimals using division

Victorian Curriculum Year 7

Understanding Practice and Fluency (UPF)

Number and Algebra

Real numbers

VCMNA247 Connect fractions, decimals and percentages and carry out simple conversions			
Quest: Fractions, decimals and percentages			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Converting fractions to percentages	1	Converting fractions to percentages using a calculator	• convert fractions to percentages using a calculator
	2	Converting fractions to terminating percentages by manipulating the denominator to 100	• convert fractions to terminating percentages by manipulating the denominator to be 100 • convert improper fractions to terminating percentages by manipulating the denominator to be 100 • convert mixed numerals to terminating percentages by manipulating the denominator to be 100
	3	Converting fractions to terminating percentages using division	• convert fractions to terminating percentages using division • convert improper fractions to terminating percentages using division • convert mixed numerals to terminating percentages using division
	4	Converting fractions to recurring percentages using division	• convert fractions to recurring percentages using division • convert improper fractions to recurring percentages using division • convert mixed numerals to recurring percentages using division
Ordering fractions, decimals and percentages	1	Ordering fractions, decimals and percentages	• order fractions, decimals and percentages
VCMNA248 Find percentages of quantities and express one quantity as a percentage of another, with and without digital technologies			
Quest: Percentages of quantities			
Percentages of quantities	1	Determining percentages of quantities (written and mental methods)	• determine percentages of quantities using written and mental strategies
	2	Determining percentages of quantities (calculator method)	• determine percentages of quantities using a calculator
	3	Expressing a smaller quantity/value as a percentage amount of another larger quantity/value	• express a smaller quantity/value as a percentage amount of another larger quantity/value in the same units • express a smaller quantity/value as a percentage amount of another larger quantity/value in different units
	4	Expressing a larger quantity/value as a percentage amount of another smaller quantity/value	• express a larger quantity/value as a percentage amount of another smaller quantity/value in the same units • express a larger quantity/value as a percentage amount of another smaller quantity/value in different units

Victorian Curriculum Year 7

Understanding Practice and Fluency (UPF)

Number and Algebra

Real numbers

VCMNA249 Recognise and solve problems involving simple ratios			
Quest: Ratios			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Using simple ratios	1	Comparing quantities measured in the same units using ratios	• compare quantities measured in the same units using ratios
		Dividing an interval into a given ratio on a number line	• divide an interval into a given ratio on a number line
	2	Expressing 1 part of a ratio as a fraction of the whole	• express 1 part of a ratio as a fraction of the whole
	3	Identifying terms of a ratio as 'parts' of the ratio	• identify terms of a ratio as 'parts' of the ratio
Simplifying ratios	1	Simplifying ratios using highest common factors	• simplify ratios using highest common factors
	2	Simplifying ratios with fractions involved	• simplify ratios containing one or more fraction parts using the HCF to re-write as a pair of fractions with a common denominator first
	3	Simplifying ratios with decimals involved	• simplify ratios containing one or more decimal parts multiplying both parts by a common power of 10 that removes the decimal. Write the resultant ratio in simplest form
	4	Identifying equivalent ratios	• identify equivalent ratios
Solve simple problems involving ratios	1	Applying the unitary method to ratio problems	• apply the unitary method to ratio problems
	2	Dividing a quantity into a given ratio	• divide a quantity into a given ratio • express the division of a quantity into 2 parts as a ratio using original amounts

Money and financial mathematics

VCMNA250 Investigate and calculate 'best buys', with and without digital technologies			
Quest: Best buys and discounts			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Best buys and discounts	1	Calculating 'best buys' by comparing price per unit, or quantity per monetary unit, with the use of digital technologies	• calculate 'best buys' by comparing price per unit, or quantity per monetary unit, with the use of digital technologies, eg 500 g for $4.50 compared with 300 g for $2.75
	2	Calculating discounts given the original price	• calculate a discount amount given the original price and the percentage discount • calculate the final price of an item given the discount percentage and original price
	3	Calculating 'best buys' by comparing price per unit, or quantity per monetary unit, without the use of digital technology	• calculate 'best buys' by comparing price per unit, or quantity per monetary unit without the use of digital technology, eg 500 g for $4.50 compared with 300 g for $2.76
	4	Calculating discounts starting with the final price	• calculate a discount amount given the final price and the percentage discount • calculate the original price given the final price and the percentage discount

Victorian Curriculum Year 7

Understanding Practice and Fluency (UPF)

Number and Algebra

Patterns and algebra

Learning Journey	Steps	Spine Nodes	Subnodes
VCMNA251 Introduce the concept of variables as a way of representing numbers using letters			
Quest: Variable and equivalent algebraic expressions			
Variable and equivalent algebraic expressions	1	Using equivalent algebraic expressions involving addition	• recognise and use equivalent algebraic expressions using algebraic symbols and words involving addition
		Using equivalent algebraic expressions involving multiplication	• recognise and use equivalent algebraic expressions using algebraic symbols and words involving multiplication
	2	Using equivalent algebraic expressions involving multiplication to indices	• recognise and use equivalent algebraic expressions using algebraic symbols and words involving multiplication
		Using equivalent algebraic expressions involving division	• recognise and use equivalent algebraic expressions using algebraic symbols and words using division
	3	Using algebraic symbols to represent mathematical operations written in words and vice versa	• use algebraic symbols to represent mathematical operations written in words and vice versa, eg the product of x and y is xy, x + y is the sum of x and y
VCMNA252 Create algebraic expressions and evaluate them by substituting a given value for each variable			
Quest: Algebraic patterns and expressions			
Number patterns	1	Using objects to build a geometric pattern, record the results in a table of values, describe the pattern in words and algebraic symbols, and represent the relationship on a number grid	• use objects to build a geometric pattern, record the results in a table of values, describe the pattern in words and algebraic symbols, and represent the relationship on a number grid
	2	Checking pattern descriptions by substituting further values	• check pattern descriptions by substituting further values
	3	Replacing written statements describing patterns with equations written in algebraic symbols	• replace written statements describing patterns with equations written in algebraic symbols
Evaluating formulae	1	Substituting known values in for pronumerals	• substitute known values in for pronumerals to find the value of an expression, eg if x = 2 and y = 3, find the value of 2x + 3y
	2	Using simple formulas to solve problems involving substituting in known variables to solve a problem	• use simple formulas to solve problems involving substituting in known variables to solve a problem
	3	Using authentic formulas to solve problems involving substituting in known variables to solve a problem	• use authentic formulas to solve problems involving substituting in known variables to solve a problem
Creating algebraic expressions	1	Creating algebraic expressions	• create algebraic expressions and evaluate them by substituting a given value for each variable
	2	Substituting into algebraic expressions and evaluating the result	• substitute into algebraic expressions and evaluate the result

Victorian Curriculum Year 7

Understanding Practice and Fluency (UPF)

Number and Algebra

Patterns and algebra

VCMNA253 Extend and apply the laws and properties of arithmetic to algebraic terms and expressions			
Quest: Simplifying algebraic expressions			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Simplifying algebraic expressions	1	Simplifying algebraic expressions that involve addition and subtraction	• extend and apply the laws and properties of arithmetic to algebraic terms and expressions • recognise like terms and add and subtract them to simplify algebraic expressions
	2	Simplifying algebraic expressions that involve multiplication	• simplify algebraic expressions that involve multiplication • recognise the equivalence of algebraic expressions involving multiplication, eg 3bc = 3cb
	3	Simplifying algebraic expressions that involve division	• simplify algebraic expressions that involve division • recognise whether particular algebraic expressions involving division are equivalent or not
	4	Connecting algebra with the commutative and associative properties of arithmetic to determine that a + b = b + a and (a + b) + c = a + (b + c)	• connect algebra with the commutative and associative properties of arithmetic to determine that a + b = b + a and (a + b) + c = a + (b + c)
		Recognising the role of grouping symbols and the different meanings of expressions, such as 2a + 1 and 2(a + 1)	• recognise the role of grouping symbols and the different meanings of expressions, such as 2a + 1 and 2(a + 1)

Linear and non-linear relationships

VCMNA255 Given coordinates, plot points on the Cartesian plane, and find coordinates for a given point			
Quest: Using the coordinate system			
Using the coordinate system	1	Locating points on the Cartesian plane	• plot and label points, given coordinates, in all 4 quadrants of the number plane • identify and label each quadrant on a number plane • identify and record the coordinates of given points in all 4 quadrants of the number plane
	2	Plotting coordinates on the Cartesian plane (not whole numbers)	• plot and label points on the Cartesian plane, given coordinates, including those with coordinates that are not whole numbers • identify and record the coordinates of given points on the Cartesian plane, including those with coordinates that are not whole numbers

Victorian Curriculum Year 7

Understanding Practice and Fluency (UPF)

Number and Algebra

Linear and non-linear relationships

VCMNA256 Solve simple linear equations			
Quest: Solving equations			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Equations introduction	1		• model preservation of equality pictorially • model preservation of equality symbolically
	2	Finding pairs of numbers that satisfy an equation with 2 unknowns	• find pairs of numbers that satisfy an equation with 2 unknowns
	3	Solving simple linear equations using concrete materials	• solve simple linear equations using concrete materials, such as the balance model or cups and counters, stressing the notion of performing the same operation on both sides of an equation
Solving 1-step equations: addition/ subtraction	1	Solving linear equationsusing inverse operations involving 1 step of addition or subtraction (integers) with integer solutions	• solve linear equationsusing inverse operations involving 1 step of addition or subtraction (integers) with integer solutions
	2	Solving linear equations using inverse operations involving 1 step of addition or subtraction (integers or decimals) with integer and non-integer solutions	• solve linear equations using inverse operations involving 1 step of addition or subtraction (integers or decimals) with integer and non-integer solutions
	3	Solving linear equations using inverse operations involving 1 step of addition or subtraction (integers or fractions) with integer and non-integer solutions	• solve linear equations using inverse operations involving 1 step of addition or subtraction (integers or fractions) with integer and non-integer solutions
Solving 1-step equations: division	1	Solving linear equations using inverse operations involving 1 step of division (integers) with integer solutions	• solve linear equations using inverse operations involving 1 step of division (integers) with integer solutions
	2	Solving linear equations using inverse operations involving 1 step of division with integer and non-integer solutions (pronumeral in numerator position)	• solve linear equations using inverse operations involving 1 step of division with integer and non-integer solutions (pronumeral in numerator position)
	3	Solving linear equations (integer, fraction or decimal coefficients) using inverse operations involving 1 step of division with integer and non-integer solutions (pronumeral in numerator position)	• solve linear equations (integer, fraction or decimal coefficients) using inverse operations involving 1 step of division with integer and non-integer solutions (pronumeral in numerator position)
Solving 1-step equations: mixed operations	1	Solving linear equations using inverse operations involving 1 step with mixed operations with integer solutions	• solve linear equations using inverse operations involving 1 step with mixed operations with integer solutions
	2	Solving linear equations using inverse operations involving 1 step with mixed operations with integer and non-integer solutions	• solve linear equations using inverse operations involving 1 step with mixed operations with integer and non-integer solutions
	3	Solving linear equations using inverse operations involving 1 step with mixed operations with integer and non-integer solutions	• solve linear equations using inverse operations involving 1 step with mixed operations with integer and non-integer solutions

Victorian Curriculum Year 7

Understanding Practice and Fluency (UPF)

Number and Algebra

Linear and non-linear relationships

VCMNA256 Solve simple linear equations			
Quest: Solving equations			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Solving 2-step equations: variable in numerator	1	Solving linear equations using inverse operations involving 2 steps with mixed operations with integer solutions (pronumeral always in numerator position)	• solve linear equations using inverse operations involving 2 steps with mixed operations with integer solutions (pronumeral always in numerator position)
	2	Solving linear equations using inverse operations involving 2 steps with mixed operations with integer and non-integer solutions (pronumeral always in numerator position)	• solve linear equations using inverse operations involving 2 steps with mixed operations with integer and non-integer solutions (pronumeral always in numerator position)
	3	Solving linear equations using inverse operations involving 2 steps with mixed operations with integer and non-integer solutions (pronumeral always in numerator position)	• solve linear equations using inverse operations involving 2 steps with mixed operations with integer and non-integer solutions (pronumeral always in numerator position)
Solving 2-step equations:variable in denominator	1	Solving linear equations using inverse operations involving 2 steps with mixed operations with integer solutions (pronumeral in numerator or denominator position)	• solve linear equations using inverse operations involving 2 steps with mixed operations with integer solutions (pronumeral in numerator or denominator position)
	2	Solving linear equations using inverse operations involving 2 steps with mixed operations with integer and non-integer solutions (pronumeral in numerator or denominator position)	• solve linear equations using inverse operations involving 2 steps with mixed operations with integer and non-integer solutions (pronumeral in numerator or denominator position)
	3	Solving linear equations using inverse operations involving 2 steps with mixed operations with integer and non-integer solutions (pronumeral in numerator or denominator position)	• solve linear equations using inverse operations involving 2 steps with mixed operations with integer and non-integer solutions (pronumeral in numerator or denominator position)

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Understanding Practice and Fluency (UPF)

Number and Algebra

Linear and non-linear relationships

VCMNA257 Investigate, interpret and analyse graphs from real life data, including consideration of domain and range			
Quest: Analysing graphs including domain & range			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Distance/time graphs	1	Matching a distance/time graph to a description of a particular journey and explaining the reasons for the choice	• match a distance/time graph to a description of a particular journey and explain the reasons for the choice
	2	Recognising concepts such as change of speed and direction in distance/time graphs	• recognise concepts such as change of speed and direction in distance/time graphs
		Understanding the meaning of straight line segments with different gradients in the graph of a particular journey	• understand the meaning of straight-line segments with different gradients in the graph of a particular journey
		Recognising the significance of horizontal line segments in distance/time graphs	• recognise the significance of horizontal line segments in distance/time graphs
		Understanding which variables go on the horizontal and vertical axis	• understand which variables go on the horizontal and vertical axis
	3	Comparing distance/time graphs of the same situation to decide which one is the most appropriate	• compare distance/time graphs of the same situation to decide which one is the most appropriate
	4	Solving problems involving distance/time rates	• solve a variety of real-life problems involving rate of travel problems
		Calculating speeds for straight line segments of given distance/time graphs	• calculate speeds for straight-line segments of given distance/time graphs
	5	Constructing distance/time graphs	• construct distance/time graphs
Graphs and rates extension	1	Interpreting information using the relative positions of 2 points on a line graph, rather than a detailed scale	• interpret information using the relative positions of 2 points on a line graph, rather than a detailed scale
	2	Calculating unit rates associated with ratios of fractions	• calculate unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units
Domain and range	1	Defining the terms domain and range of a graph	• define the terms domain and range of a graph
	2	Determining the domain of a given graph	• determine the domain of a given graph
	3	Determining the range of a given graph	• determine the range of a given graph

Victorian Curriculum Year 7

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Using units of measurement

VCMMG258 Establish the formulas for areas of rectangles, triangles and parallelograms and use these in problem solving			
Quest: Solve area problems			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Solving area problems involving rectangles	1	Applying the formula for the area of a rectangle	• apply the formula for area of a rectangle to find the area of rectangles given 2 side lengths measured in the same or different units • apply the formula for area of a rectangle to find the area of composite rectilinear figures, such as an L-shape, U-shape • apply the formula to real life contexts
	2	Investigating and comparing the areas of rectangles that have the same perimeter	• investigate and compare the areas of rectangles that have the same perimeter, eg compare the areas of all possible rectangles with whole-number dimensions and a perimeter of 20 centimetres
	3	Finding the dimensions of rectangles and squares given their areas	• find the possible dimensions of rectangles and squares given their areas
Solving area problems involving triangles	1	Applying the formula to find the areas of right-angled triangles	• apply the formula to find the areas of right-angled triangles
	2	Applying the formula to find the areas of non right-angled triangles	• apply the formula to find the areas of triangles in which the perpendicular height meets the base within the length of the base • apply the formula to find the areas of triangles in which the perpendicular height meets the base outside the length of the base
	3	Finding the dimensions of a right-angled triangle given its area	• find the dimensions of a right-angled triangle given its area and either its base or height by using the formula for the area of a triangle
	4	Finding the dimensions of a non right-angled triangle given its area	• find the dimensions of non right-angled triangles given its area and either its base or height using the formula for the area of a triangle • find the dimensions of non right-angled triangles in which the perpendicular height meets the base outside the length of the base given its area and either its base or height by using the formula for the area of a triangle
	5	Solving real-life problems involving calculating the area of triangles	• solve real-life problems involving calculating the area of triangles
Solving area problems involving parallelograms	1	Finding the area of a parallelogram using a formula	• apply the formula to find the area of parallelograms in different orientations • apply the formula to find the area of parallelograms in different orientations which include more dimensions than are necessary to calculate the area
	2	Finding the dimensions of a parallelogram given its area	• find the dimensions of a parallelogram given its area and either its length or width by using the formula for the area of a parallelogram • find the dimensions of a parallelogram in different orientations given its area and either its length or width by using the formula for the area of a parallelogram
	3	Solving real-life problems involving calculating the area of parallelograms	• solve real-life problems involving calculating the area of parallelograms

Victorian Curriculum Year 7

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Using units of measurement

VCMMG258 Establish the formulas for areas of rectangles, triangles and parallelograms and use these in problem solving			
Quest: Solve area problems			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Solving area problems: simple composite figures	1	Calculating the area of composite shapes constructed from triangles and special quadrilaterals	• apply area formulas for a variety of composite shapes to calculate their area
VCMMG259 Calculate volumes of rectangular prisms			
Quest: Volume of rectangular prisms			
Volume of rectangular prisms	1	Calculating the volumes of rectangular prisms using additive and multiplicative strategies	• describe rectangular prisms in terms of layers • use repeated addition to find the volumes of rectangular prisms • calculate the volumes of rectangular prisms in cubic centimetres and cubic metres including calculating the volume given the net for the shape • record calculations used to find the volumes of rectangular prisms

Shape

VCMMG260 Draw different views of prisms and solids formed from combinations of prisms			
Quest: Explore different views of prisms/solids			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Explore different views of prisms/ solids	1	Drawing (in two dimensions) prisms from different views by connecting cubes, including top, side, front and back views	• draw from connecting cubes (in two dimensions) prisms from different views, including top, side, front and back views
	2	Drawing (in two dimensions) solids formed from combinations of prisms by connecting cubes, from different views, including top, side, front and back views	• draw from connecting cubes (in two dimensions) solids formed from combinations of prisms, from different views, including top, side, front and back views
	3	Drawing (in two dimensions) prisms from different views, including top, side, front and back views	• draw (in two dimensions) prisms from different views, including top, side, front and back views
		Drawing (in two dimensions) solids formed from combinations of prisms, from different views, including top, side, front and back views	• draw (in two dimensions) solids formed from combinations of prisms, from different views, including top, side, front and back views
	4	Identifying prisms from their cross-section	• identify the cross-sections of different prisms
		Drawing the cross-sections of prisms	• draw the cross-sections of prisms

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Understanding Practice and Fluency (UPF)

Measurement and Geometry

Location and transformation

VCMMG261 Describe translations, reflections in an axis, and rotations of multiples of 90° on the Cartesian plane using coordinates. Identify line and rotational symmetries			
Quest: Transformations and symmetry			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Transformations on the cartesian plane	1	Plotting transformations of points on the Cartesian plane	• plot and state the coordinates of the image of a point on the Cartesian plane resulting from 1 or more translations
	2	Plotting and stating the coordinates of the image of a given point on the Cartesian plane resulting from reflection in either the x-axis or y-axis	• plot and state the coordinates of the image of a given point on the Cartesian plane resulting from reflection in either the x-axis or y-axis
	3	Plotting and stating the coordinates of the image of a given point on the Cartesian plane resulting from rotation of multiples of 90° about the origin	• plot and state the coordinates of the image of a given point on the Cartesian plane resulting from a rotation of 90° about the origin • plot and state the coordinates of the image of a given point on the Cartesian plane resulting from a rotation of 180° about the origin • plot and state the coordinates of the image of a given point on the Cartesian plane resulting from a rotation of 270° about the origin
Line and rotational symmetry	1	Identifying line symmetry	• identify, draw and determine the total number of lines of symmetry on designs and shapes, including special triangles, quadrilaterals and polygons • complete symmetrical designs and shapes given their line of symmetry
	2	Determining rotational symmetry	• determine whether or not given shapes and designs have rotational symmetry • determine the order of rotational symmetry for given shapes and designs
	3	Determining lines (axes) of symmetry and the order of rotational symmetry of polygons, including the special quadrilaterals	• determine if particular triangles and quadrilaterals have line and/or rotational symmetry
	4	Investigating the line and rotational symmetries of circles and of diagrams involving circles, such as a sector or a circle with a marked chord or tangent	• investigate if a particular circle with a marked chord or tangent, sector of a circle or a regular circle has a line and/or rotational symmetry
	5	Identifying line and rotational symmetries in pictures and diagrams	• identify if a picture or diagram has a line and/or rotational symmetry

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Understanding Practice and Fluency (UPF)

Measurement and Geometry

Geometric reasoning

VCMMG262 Classify triangles according to their side and angle properties and describe quadrilaterals			
Quest: Triangles and quadrilaterals			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Labelling and naming conventions	1	Labelling common shapes	• label and name triangles (eg triangle ABC or ΔABC) and quadrilaterals (eg ABCD) in text and on diagrams • use the common conventions to mark equal intervals on diagrams
Geometry conventions	1	Using the language and conventions of geometry	• define, name, label and draw points using capital letters • define, name, label and draw lines using capital letters • define, name, label and draw rays using capital letters • define, name, label and draw line segments using capital letters • define, name, label and draw angles using capital letters • name, label and draw triangles using capital letters • name, label and draw quadrilaterals and other polygons using capital letters • use common conventions to label right angles and equal angles on diagrams • use common conventions to label equal line segments on diagrams
Properties of triangles	1	Classifying types of triangles	• recognise and classify types of triangles on the basis of their properties (acute-angled, right-angled, obtuse-angled, equilateral, isosceles and scalene triangles) • recognise that a given triangle may belong to more than 1 class
	2	Sketching and labelling triangles from a worded or verbal description	• determine whether the triangle exists according to its physical description
Convex and non-convex quadrilaterals	1	Distinguishing between convex and non-convex quadrilaterals	• distinguish between convex and non-convex quadrilaterals using the fact that the diagonals of a convex quadrilateral lie inside the figure • distinguish between convex and non-convex quadrilaterals using the fact that a non-convex quadrilateral that has an interior angle greater than 180 degrees
Properties of quadrilaterals	1	Investigating properties of special quadrilaterals: squares	• prove a quadrilateral is a rectangle using properties • prove a quadrilateral is a square using properties
	2	Investigating properties of special quadrilaterals: parallelograms	• prove a quadrilateral is a parallelogram using properties
	3	Investigating properties of special quadrilaterals: rhombuses	• prove a quadrilateral is a rhombus using properties
	4	Investigating properties of special quadrilaterals: trapeziums/ trapezoids	• prove a quadrilateral is a trapezium using properties
	5	Investigating properties of special quadrilaterals: kites	• prove a quadrilateral is a kite using properties

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Understanding Practice and Fluency (UPF)

Measurement and Geometry

Geometric reasoning

VCMMG262 Classify triangles according to their side and angle properties and describe quadrilaterals			
Quest: Triangles and quadrilaterals			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Reasoning, sketching and describing quadrilaterals	1	Reasoning about special quadrilaterals on the basis of their properties	• classify a set of quadrilaterals based on their properties • identify a given quadrilateral from its description • identify a given quadrilateral from a diagram
	2	Describing special quadrilaterals	• describe a quadrilateral in sufficient detail for it to be sketched
	3	Reasoning about triangles and special quadrilaterals	• use the properties of special triangles and quadrilaterals to solve simple numerical problems with appropriate reasoning • recognise special types of triangles and quadrilaterals embedded in composite figures or drawn in various orientations
Using properties of triangles & quadrilaterals	1	Reasoning about triangles and special quadrilaterals	• use the properties of special triangles and quadrilaterals to solve simple numerical problems with appropriate reasoning • recognise special types of triangles and quadrilaterals embedded in composite figures or drawn in various orientations
	2	Determining unknown sides and angles embedded in diagrams, using the properties of special triangles and quadrilaterals, giving reasons	• determine unknown sides and angles embedded in diagrams, using the properties of special triangles and quadrilaterals, giving reasons
VCMMG263 Demonstrate that the angle sum of a triangle is 180° and use this to find the angle sum of a quadrilateral			
Quest: Solving problems: interior angle sums			
Solving problems: interior angle sums	1	Exploring and proving the interior angle sum of a triangle	• calculate an unknown angle represented by a variable within a triangle, given the other 2 angles
	2	Finding the interior angle sum of a quadrilateral	• calculate an unknown angle/s represented by a variable/s within quadrilaterals, given the appropriate angles
	3	Combination of steps 1 and 2	
VCMMG264 Identify corresponding, alternate and co-interior angles when two straight lines are crossed by a transversal			
Quest: Angle relationships and parallel lines			
Angles at a point	1	Calculating complementary angles	• define complementary angles and identify them in diagrams • calculate the size of an unknown angle in a diagram and explain how this is done (using complementary angles) • define supplementary angles and identify them in diagrams • calculate the size of an unknown angle in a diagram and explain how this is done (using supplementary angles)
	2	Investigating and identifying adjacent angles	• identify adjacent angles within a diagram

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Understanding Practice and Fluency (UPF)

Measurement and Geometry

Geometric reasoning

VCMMG264 Identify corresponding, alternate and co-interior angles when two straight lines are crossed by a transversal			
Quest: Angle relationships and parallel lines			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Angles at a point	3	Calculating where angles form a revolution	• calculate the size of an unknown angle in a diagram and explain how this is done (using knowledge of angles that add to 360°)
	4	Identifying and naming right angles, straight angles, vertically opposite angles and angles of complete revolution embedded in diagrams	• identify and naming right angles, straight angles, vertically opposite angles and angles of complete revolution embedded in diagrams
	5	Applying geometric reasoning for adjacent angle relationships	• apply theorems of complementary angles, supplementary angles, vertically opposite and adjacent angles, calculating unknown angles • apply theorems for adjacent angles represented by variables in multi-step problems, writing equations to solve for an unknown angle, checking the reasonableness of the answer • apply theorems of complementary angles, supplementary angles, vertically opposite and adjacent angles in multi-step problems, calculating unknown angles and stating all relationships used
Parallel and perpendicular line conventions	1	Identifying perpendicular and parallel lines	• name and record perpendicular lines using the conventional notation • define parallel lines and identify them in pictures, designs, diagrams and the environment, using conventional notation to mark them • name and record parallel lines using the conventional notation
Angle relationships on parallel lines	1	Exploring special pairs of angles on parallel lines	• define, identify and draw transversals on sets of 2 or more parallel lines • define and identify pairs of equal corresponding angles when 2 or more parallel lines are cut by a transversal • define and identify pairs of equal alternate angles when 2 or more parallel lines are cut by a transversal • define and identify pairs of supplementary cointerior angles when 2 or more parallel lines are cut by a transversal
	2	Applying geometric reasoning with corresponding angles on parallel lines	• use corresponding angles on parallel lines to calculate unknown angles represented by variables
	3	Applying geometric reasoning with alternate angles on parallel lines	• use alternate angles on parallel lines to calculate unknown angles represented by variables
	4	Applying geometric reasoning with co-interior angles on parallel lines	• use cointerior angles on parallel lines to calculate unknown angles represented by variables
	5	Applying geometric reasoning with angles on parallel lines by choosing the appropriate angle relationship	• choose and apply the appropriate angle property to calculate unknown angles on parallel lines represented by variables

Victorian Curriculum Year 7

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Geometric reasoning

VCMMG265 Investigate conditions for two lines to be parallel and solve simple numerical problems using reasoning			
Quest: Parallel lines and geometric reasoning			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Proving parallel lines	2	Proving lines are parallel	• prove or disprove that a pair of lines are parallel using the relationships between corresponding angles, alternate angles, and cointerior angles
Geometric reasoning using angle properties	1	Applying geometric reasoning with angles at a point and angles on parallel lines	• apply theorems of angles at a point and angles on parallel lines to solve numerical geometric problems involving up to 3 theorems/steps, giving a reason for each step of the solution

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Understanding Practice and Fluency (UPF)

Statistics and Probability

Chance

VCMSP266 Construct sample spaces for single-step experiments with equally likely outcomes			
Quest: Chance experiments and sample spaces			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Language of chance experiments	1	Understanding the language around chance	• understand that the term 'chance experiment' is used when referring to actions such as tossing a coin, rolling a dice or randomly selecting an object from a bag • understand that the term 'outcome' is used to describe a possible result of a chance experiment and list all of the possible outcomes for a single-step experiment • understand that the term 'sample space' is used to describe a list of all of the possible outcomes for a chance experiment • use the term 'probability' to describe the numerical value that represents the likelihood of an outcome of a chance experiment • arrange the likelihood of chance experiment outcomes in order from least likely to most likely (and vice versa)
Sample spaces	1	Identifying equally likely outcomes in single-step chance experiments	• identify equally likely outcomes in single-step chance experiments
	2	Identifying the sample space for a probability experiment involving 1 event	• identify the sample space for a probability experiment involving 1 event
	3	Identifying the sample space for a probability experiment involving 2 independent events	• identify the sample space (where the combined sample space has 36 or fewer elements) for a probability experiment involving 2 independent events
	4	Listing the outcomes for chance experiments where the outcomes are not equally likely to occur and assign probabilities to the outcomes using fractions	• list the outcomes for chance experiments where the outcomes are not equally likely to occur and assign probabilities to the outcomes using fractions
Chance experiments	1	Describing single-step chance experiments in which the outcomes are equally likely	• describe single-step chance experiments in which the outcomes are equally likely
	2	Describing single-step chance experiments in which the outcomes are equally and not equally likely	• describe single-step chance experiments in which the outcomes are equally and not equally likely
	3	Creating and conducting a chance experiment given equally probable events	• determine the theoretical probability of a series of events using tree diagrams • compare the expected probabilities with the observed probabilities after both small and large numbers of trials for the chance experiment given equally probable events
	4	Creating and conducting a chance experiment given unequally probable events	• determine the theoretical probability of a series of unequally probable events using tree diagrams • compare the expected probabilities with the observed probabilities after both small and large numbers of trials, given unequally probable events

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Understanding Practice and Fluency (UPF)

Statistics and Probability

Chance

VCMSP267 Assign probabilities to the outcomes of events and determine probabilities for events			
Quest: Probability			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Language of probability	1	Recognising that a probability of 0 is for events that are impossible and a probability of 1 for events that are certain to occur	• recognise that a probability of 0 is for events that are impossible and a probability of 1 for events that are certain to occur
	2	Relating calculated probabilities with the language of chance and the likelihood number line	• relate calculated probabilities with the language of chance and the likelihood number line
	3	Assigning numerical probabilities with their associated language	• assign language such as impossible, highly unlikely, unlikely, even chance, likely, highly likely and certain to the known probabilities of outcomes occurring • allocate words such as impossible, highly unlikely, unlikely, even chance, likely, highly likely and certain along a number line from 0 to 1 representing their respective probabilities
Understanding basic probability	1	Explaining the meaning of 0, 1/2 and 1 in a given chance situation, using the language of chance	• explain the meaning of 0, 1/2 and 1 in a given chance situation, using the language of chance
	2	Applying probabilities to simple events by reasoning about equally likely outcomes	• apply probabilities to simple events by reasoning about equally likely outcomes
	3	Expressing the theoretical probability of an event formally	• express the theoretical probability of an event, given a number of equally likely outcomes in the sample space, as P(event) = number of favourable outcomes ÷ total number of outcomes
	4	Expressing probabilities as decimals, fractions and percentages	• express probabilities as decimals, fractions and percentages
		Interpreting probabilities expressed as fractions, percentages or decimals	• interpret probabilities expressed as fractions, percentages or decimals
	5	Calculating the probability of an event of a single-step experiment using cards, dice, spinners, etc	• calculate the probability of an event of a single-step experiment using cards, dice, spinners, etc

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Understanding Practice and Fluency (UPF)

Statistics and Probability

Data representation and interpretation

VCMSP268 Identify and investigate issues involving numerical data collected from primary and secondary sources			
Quest: Collecting and interpreting data			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Issues with data from primary & secondary sources	1	Identifying and investigating issues involving numerical data collected from primary and secondary sources	• identify the difference between data collected from primary and secondary sources, eg data collected in the classroom compared with data drawn from a media source
	2	Exploring issues involved in constructing and conducting surveys, such as sample size, bias, type of data required, and ethics	• detect and discuss bias, if any, in the selection of a sample
Collecting and interpreting data	1	Constructing appropriate survey questions and a related recording sheet in order to collect both numerical and categorical data about a matter of interest	• construct a recording sheet that allows efficient collection of the different types of data expected • decide whether a census or a sample is more appropriate to collect the data required to investigate the matter of interest
	2	Collecting and interpreting information from secondary sources, presented as tables and/or graphs, about a matter of interest	• collect and interpret information from secondary sources, presented as tables and/or graphs, about a matter of interest, eg sporting data, information about the relationship between wealth or education and the health of populations of different countries • interpret and use scales on graphs, including those where abbreviated measurements are used, eg '50' on a vertical axis representing thousands is interpreted as '50 000' • identify features on graphical displays that may mislead and result in incorrect interpretation, eg displaced zeros, the absence of labelling on 1 or both axes, potentially misleading units of measurement
	3	Using spreadsheets or statistical software packages to tabulate and graph data	• use spreadsheets or statistical software packages to tabulate and graph data
	4	Discussing ethical issues that may arise from collecting and representing data	• discuss ethical issues that may arise from collecting and representing data
VCMSP269 Construct and compare a range of data displays including stem-and-leaf plots and dot plots			
Quest: Representing data			
Tallies and frequency distribution tables	1	Using a tally to organise data into a frequency distribution table	• use a tally to organise data into a frequency distribution table
		Interpreting a discrete data set from its histogram and polygon	• interpret a discrete data set from its histogram and polygon
Frequency histograms and polygons	1	Interpreting a discrete data set from its histogram and polygon	• interpret a discrete data set from its histogram and polygon
	2	Constructing and interpreting frequency histograms and polygons	• construct and interpret frequency histograms and polygons

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Understanding Practice and Fluency (UPF)

Statistics and Probability

Data representation and interpretation

VCMSP269 Construct and compare a range of data displays including stem-and-leaf plots and dot plots			
Quest: Representing data			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Frequency histograms and polygons: grouped data	1	Interpreting a discrete data set from its histogram and polygon where grouping is required	• interpret a discrete data set from its histogram and polygon where grouping is required
	2	Constructing histograms for discrete data sets where grouping is required	• construct histograms for discrete data sets where grouping is required
	3	Constructing combined histograms and polygons for discrete data sets where grouping is required	• construct combined histograms and polygons for discrete data sets where grouping is required
Dot plots	1	Interpreting dot plots	• interpret dot plots
	2	Constructing dot plots	• construct dot plots
Ordered stem-and-leaf plots	1	Interpreting ordered stem-and-leaf plots with whole numbers and simple decimal values	• interpret ordered stem-and-leaf plots with whole numbers and simple decimal values
	2	Constructing ordered stem-and-leaf plots with whole numbers	• construct ordered stem-and-leaf plots with whole numbers only
	3	Constructing ordered stem-and-leaf plots with whole numbers and simple decimal values	• construct ordered stem-and-leaf plots with whole numbers and simple decimal values
Divided bar graphs	1	Interpreting divided bar graphs	• interpret divided bar graphs
	2	Constructing divided bar graphs with the use of digital technology	• construct divided bar graphs with the use of digital technology
	3	Constructing divided bar graphs without the use of digital technology	• calculate the length of the bar required for each section of divided bar graphs
Line graphs	1	Interpreting line graphs	• interpret line graphs
	2	Constructing line graphs with the use of digital technology	• construct line graphs with the use of digital technology
Interpreting a variety of different graphs	1	Interpreting a variety of graphs, including dot plots, stem-and-leaf plots, divided bar graphs, sector graphs and line graphs	• interpret a variety of graphs, including dot plots, stem-and-leaf plots, divided bar graphs, sector graphs and line graphs • calculate the percentage of the whole represented by different categories in a divided bar graph or sector graph • draw conclusions from data displayed in a graph, eg 'The graph shows that the majority of Year 8 students who play a musical instrument play a string instrument' • critique ways in which data is presented in sector graphs, line graphs, bar graphs and pictographs

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Understanding Practice and Fluency (UPF)

Statistics and Probability

Data representation and interpretation

VCMSP270 Calculate mean, median, mode and range for sets of data. Interpret these statistics in the context of data			
Quest: Mean, Median, Mode and Range			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Calculating the mean	1	Calculating the mean of a set of data using mean = sum of data values/ number of data values	• calculate the mean of a set of data using mean = sum of data values/number of data values
	2	Using the statistical functions of a spreadsheet to determine the mean for large sets of data	• use the statistical functions of a spreadsheet to determine the mean for large sets of data
Median mode and range	1	Determining the median for sets of data without the use of digital technology	• determine the median for sets of data without the use of digital technology and containing an odd number of scores • determine the median for sets of data without the use of digital technology and containing an even number of scores
	2	Determining the mode for sets of data without the use of digital technology	• determine the mode for sets of data without the use of digital technology
	3	Determining the range for sets of data without the use of digital technology	• determine the range for sets of data without the use of digital technology
	4	Determining the median, mode and range for sets of data using digital technology	• determine the median, mode and range for sets of data using digital technology • use the statistical functions of a spreadsheet to determine the median, mode and range for large sets of data
VCMSP271 Describe and interpret data displays using median, mean and range			
Quest: Mean, median and mode to analyse data			
Mean, median and mode to analyse data	1	Calculating measures of location (mean, median and mode) and the range for data represented in a variety of statistical displays, including frequency distribution tables, frequency histograms, stem-and-leaf plots and dot plots	• Calculating measures of location (mean, median and mode) and the range for data represented in a variety of statistical displays, including frequency distribution tables, frequency histograms, stem-and-leaf plots and dot plots
	2	Drawing conclusions based on the analysis of data displays using the mean, median and/or mode, and range	• draw conclusions based on the analysis of data displays using the mean, median and/or mode, and range

Victorian Curriculum Year 8

Understanding Practice and Fluency (UPF)

Number and Algebra

Number and place value

VCMNA272 Use index notation with numbers to establish the index laws with positive integral indices and the zero index			
Quest: Investigating index laws			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Investigating index laws	1	Multiplying 2 or more terms with the same numerical base and a positive-integer power, leaving the solution in index form	• multiply 2 or more terms with the same numerical base and a positive-integer power, leaving the solution in index form
	2	Dividing 2 or more terms with the same numerical base and a positive-integer power, leaving the solution in index form	• divide 2 or more terms with the same numerical base and a positive-integer power, leaving the solution in index form
	3	Calculating an expression in which a number in index form is raised by a positive-integer power	• calculate an expression in which a number in index form is raised by a positive-integer power
	4	Using the zero index rule to simplify expressions involving numbers to the power of zero	• use the zero index rule to simplify expressions involving numbers to the power of zero
VCMNA273 Carry out the four operations with rational numbers and integers, using efficient mental and written strategies and appropriate digital technologies and make estimates for these computations			
Quest: Applying the four operations to integers			
Applying the four operations to integers	1	Using the 4 operations with integers	• use the 4 operations to solve problems involving integers
	2	Applying the order of operations to evaluate expressions involving integers with no exponents or radicals	• apply the order of operations to evaluate expressions involving integers with no exponents or radicals
	3	Applying the order of operations to evaluate expressions involving integers where the operator is contained within the numerator or denominator of a fraction	• apply the order of operations to evaluate expressions involving integers, where an operator is contained within the numerator or denominator of a fraction and the result is a whole number • apply the order of operations to evaluate expressions involving integers where the operator is contained within the numerator or denominator of a fraction

Victorian Curriculum Year 8

Understanding Practice and Fluency (UPF)

Number and Algebra

Real numbers

VCMNA274 Investigate terminating and recurring decimals			
Quest: Terminating and recurring decimals			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Terminating and recurring decimals	1	Converting fractions to terminating decimals by manipulating the denominator to be a power of 10	• convert fractions to terminating decimals by manipulating the denominator to be a power of 10 • convert improper fractions to terminating decimals by manipulating the denominator to be a power of 10 • convert mixed numerals to terminating decimals by manipulating the denominator to be a power of 10
VCMNA275 Investigate the concept of irrational numbers, including π			
Quest: Irrational numbers			
Investigating irrational numbers	1	Describing, informally, the properties of irrational numbers	• describe, informally, the properties of irrational numbers
Exploring irrational numbers (surds)	1	Describing, informally, the properties of irrational numbers	• describe, informally, the properties of irrational numbers
	2	Using rational approximations of irrational numbers to compare the size of irrational numbers	• use rational approximations of irrational numbers to compare the size of irrational numbers
	3	Approximating the location of irrational numbers on a number line	• approximate the location of irrational numbers on a number line
VCMNA276 Solve problems involving the use of percentages, including percentage increases and decreases and percentage error, with and without digital technologies			
Quest: Working with percentages			
Increasing and decreasing amounts	1	Increasing and decreasing amounts by percentages (calculator method)	• increase and decrease a quantity by a given percentage using the calculator method
	2	Increasing and decreasing amounts by percentages (written and mental methods)	• increase an amount by first calculating the percentage increase value of the original amount, and then adding that result to the original amount • decrease an amount by first calculating the percentage decrease value of the original amount, and then subtracting that result from the original amount
	3	Recognising and using equivalences when calculating percentage increases and decreases	• increase an amount by a percentage by multiplying the original amount by 1 + the percentage increase expressed as a decimal • decrease an amount by a percentage by multiplying the original amount by 1 - the percentage decrease expressed as a decimal • decrease an amount by a percentage by calculating the complementary percentage of that amount

Victorian Curriculum Year 8

Understanding Practice and Fluency (UPF)

Number and Algebra

Real numbers

Learning Journey	Steps	Spine Nodes	Subnodes
VCMNA276 Solve problems involving the use of percentages, including percentage increases and decreases and percentage error, with and without digital technologies			
Quest: Working with percentages			
Problem solving involving percentages	1	Using the unitary method to solve problems involving percentages (written method)	• use the unitary method to find the original quantity/value following a percentage increase/ decrease, eg find the original value, given the value after an increase of 20% • find original value after a percentage increase/ decrease
	2	Using the unitary method to solve problems involving percentages (calculator method)	• use the unitary method with a calculator to solve problems involving percentages, eg find the original value given the value after an increase of 20% • find the original value after a percentage increase/ decrease
	3	Interpreting and using nutritional information panels on product packaging where percentages are involved	• interpret and use nutritional information panels on product packaging where percentages are involved
		Interpreting and using statements about the environment involving percentages, eg energy use for different purposes such as lighting	• interpret and use statements about the environment involving percentages, eg energy use for different purposes, such as lighting
	4	Solving real-life problems involving percentages	• solve a variety of real-life problems involving percentages, including percentage composition problems and problems involving money
Percentage error	1	Defining percentage error in calculations or measurements	• define percentage error in calculations or measurements
		Calculating percentage error involving a given or actual value, and an estimated or measured value	• calculate percentage error involving a given or actual value, and an estimated or measured value
	2	Using percentage error to compare relative size of error in calculations involving a given or actual value, and an estimated or measured value	• use percentage error to compare relative size of error in calculations involving a given or actual value, and an estimated or measured value
VCMNA277 Solve a range of problems involving rates and ratios, including distance-time problems for travel at a constant speed, with and without digital technologies			
Quest: Rates and ratios			
Solve problems involving ratios	1	Dividing a given quantity into 2 parts in a given part:whole ratio	• divide a given quantity into 2 parts in a given part:whole ratio
	2	Solving a variety of real-life problems involving dividing quatities into a given ratio	• solve a variety of real-life problems involving dividing quantities into a given ratio
Ratios involving more than two parts	1	Simplifying ratios using highest common factors (ratio composed of 3 or more numbers)	• simplify ratios using highest common factors
	2	Dividing a quantity into a given ratio (ratio composed of 3 or more numbers)	• divide a quantity in a given ratio
	3	Applying the unitary method to ratio problems (ratio composed of 3 or more numbers)	• apply the unitary method to ratio problems

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Understanding Practice and Fluency (UPF)

Number and Algebra

Real numbers

VCMNA277 Solve a range of problems involving rates and ratios, including distance-time problems for travel at a constant speed, with and without digital technologies			
Quest: Rates and ratios			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Converting ratios	1	Converting units in a ratio into the same unit then simplifying	• convert units of a ratio into the same unit • simplify ratios
	2	Converting between units of measurement using ratios	• convert between units of measurement using ratios
Using rates	1	Introducing rates	• use rates to compare quantities measured in different units
	2	Converting given information into a simplified rate	• convert given information into a simplified rate
	3	Comparing rates	• compare 2 quantities of different rates
	4	Determining an amount for a given time period given a rate	• determine an amount for a given time period given a unit rate • determine an amount for a given time period given a rate
		Solving problems involving distance/ time rates	• solve a variety of real-life problems involving rate of travel problems
	5	Solving problems comparing 2 given rates by simplifying	• solve problems comparing 2 given rates by simplifying

Money and financial mathematics

VCMNA278 Solve problems involving profit and loss, with and without digital technologies			
Quest: Solving problems involving profit & loss			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Solving problems involving profit & loss	1	Understanding the financial terms 'profit' and 'loss'	• understand the meaning of the terms 'cost price', 'sale price', 'profit and loss' and the relationships between them
	2	Solving problems involving profit and loss with the use of digital technology	• calculate the selling price, given the percentage profit/loss on the cost price with the use of digital technology • express profit/loss as a percentage of the cost price with the use of digital technology • calculate the cost price, given the selling price and percentage profit/loss with the use of digital technology
	3	Solving problems involving profit and loss without the use of digital technology	• calculate the selling price, given the percentage profit/loss on the cost price without the use of digital technology • express profit/loss as a percentage of the cost price without the use of digital technology • calculate the cost price, given the selling price and percentage profit/loss without the use of digital technology
	4	Solving complex problems involving multiple steps	• solve complex problems involving multiple steps

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Understanding Practice and Fluency (UPF)

Number and Algebra

Patterns and algebra

VCMNA279 Extend and apply the distributive law to the expansion of algebraic expressions			
Quest: Extending&applying the distributive law			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Solving problems involving profit & loss	1	Expanding algebraic expressions in the form a(b+c) by removing grouping symbols (distributive law) where a and c are positive integers and b is a variable with coefficient of 1	• expand algebraic expressions in the form a(b+c) by removing grouping symbols (distributive law) where a and c are positive integers and b is a variable with coefficient of 1
	2	Expanding algebraic expressions in the form a(b+c) by removing grouping symbols (distributive law) where a and c are positive or negative integers and b is a variable with coefficient of 1	• expand algebraic expressions in the form a(b+c) by removing grouping symbols (distributive law) where a and c are positive or negative integers and b is a variable with coefficient of 1
	3	Expanding algebraic expressions in the form a(b+c) by removing grouping symbols (distributive law) where a, b, and c can be positive numbers or variables (coefficients are 1)	• expand algebraic expressions in the form a(b+c) by removing grouping symbols (distributive law) where a, b, and c can be positive numbers or variables (coefficients are 1)
	4	Expanding algebraic expressions in the form a(b+c) by removing grouping symbols (distributive law) where a, b and c can be positive or negative numbers or variables (coefficients 1 or -1)	• expand algebraic expressions in the form a(b+c) by removing grouping symbols (distributive law) where a, b and c can be positive or negative numbers or variables (coefficients 1 or -1)
	5	Expanding algebraic expressions in the form a(b+c) by removing grouping symbols (distributive law) where a, b and c can be positive or negative numbers or variables (coefficients integers not limited to 1)	• expand algebraic expressions in the form a(b+c) by removing grouping symbols (distributive law) where a, b and c can be positive or negative numbers or variables (coefficients integers not limited to 1)
VCMNA280 Factorise algebraic expressions by identifying numerical factors			
Quest: Factorising algebraic expressions			
Factorising algebraic expressions	1	Decomposing (factorising) algebraic expressions by identifying numerical and algebraic factors	• decompose (factorise) algebraic expressions by identifying numerical and algebraic factors and writing it as a product of these
	2	Factorising algebraic expressions by identifying numerical factors	• factorise algebraic expressions by finding a common numerical factor and bringing it out the front of the brackets with its product inside the brackets
	3	Factorising algebraic expressions by identifying negative numerical factors	• factorise algebraic expressions by finding a common negative numerical factor and bringing it out the front of the brackets with its product inside the brackets
Factorising algebraic expressions 2	1	Factorising algebraic expressions by identifying only algebraic factors	• factorise algebraic expressions by finding a common algebraic factor and bringing it out the front of the brackets with its product inside the brackets
	2	Factorising algebraic expressions by identifying algebraic and numerical factors	• factorise algebraic expressions by finding a common algebraic and numerical factor and bringing it out the front of the brackets with its product inside the brackets

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Understanding Practice and Fluency (UPF)

Number and Algebra

Linear and non-linear relationships

VCMNA281 Simplify algebraic expressions involving the four operations			
Quest: Simplfying algebraic expressions using mixed operations			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Simplfying algebraic expressions using mixed operations	1	Simplifying algebraic expressions involving the 4 operations	• simplify a range of algebraic expressions, including those involving mixed operations • apply the order of operations to simplify algebraic expressions
VCMNA282 Use algorithms and related testing procedures to identify and correct errors			
VCMNA283 Plot linear relationships on the Cartesian plane with and without the use of digital technologies			
Quest: Linear relationships			
Working with Linear Sequences	1	Investigating and extending numeric and geometric patterns represented in a table	• investigate and extend numeric patterns represented in a table • investigate and extend geometric patterns represented in a table
	2	Finding the nth term of linear sequences arising from a given set of numbers or sequences generated from concrete/visual representations with integer coefficients of n	• find the nth term of increasing linear sequences arising from a given set of numbers or sequences generated from concrete/visual representations with integer coefficients of n • find the nth term of decreasing linear sequences arising from a given set of numbers or sequences generated from concrete/visual representations with integer coefficients of n
	3	Finding the nth term of linear sequences arising from a given set of numbers or sequences generated from concrete/visual representations with decimal coefficients of n	• find the nth term of increasing linear sequences arising from a given set of numbers or sequences generated from concrete/visual representations with decimal coefficients of n • find the nth term of decreasing linear sequences arising from a given set of numbers or sequences generated from concrete/visual representations with decimal coefficients of n
		Finding the nth term of linear sequences arising from a given set of numbers or sequences generated from concrete/visual representations with fractional coefficients of n	• find the nth term of increasing linear sequences arising from a given set of numbers or sequences generated from concrete/visual representations with fractional coefficients of n • find the nth term of a decreasing linear sequences arising from a given set of numbers or sequences generated from concrete/visual representations with fractional coefficients of n
	4		• use the nth term rule to determine whether a number exists in a sequence
	5	Solving problems involving the use of the nth term formula for a linear sequence	• solve problems involving the use of the nth term formula for a linear sequence
Table of values	1		• identify a table of values matching a linear relationship plotted on the number plane (with and without digital technology) • identify the table of values for a given number pattern that matches the points plotted on a number plane • describe the linear relationship and the rules (term-to-term and also position-to-term)

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Understanding Practice and Fluency (UPF)

Number and Algebra

Linear and non-linear relationships

VCMNA284 Solve linear equations using algebraic and graphical techniques. Verify solutions by substitution			
Quest: Solving linear equations			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Solving 3-step equations	1	Solving linear equations (integer coefficients) using inverse operations involving 3 steps with mixed operations with integer solutions	• solve linear equations (integer coefficients) using inverse operations involving 3 steps with mixed operations with integer solutions
	2	Solving linear equations (integer coefficients) using inverse operations involving 3 steps with mixed operations with integer and non-integer solutions	• solve linear equations (integer coefficients) using inverse operations involving 3 steps with mixed operations with integer and non-integer solutions
	3	Solving linear equations (integer, fraction or decimal coefficients) using inverse operations involving 3 steps with mixed operations with integer and non-integer solutions	• solve linear equations (integer, fraction or decimal coefficients) using inverse operations involving 3 steps with mixed operations with integer and non-integer solutions
Solving equations with variable on both sides	1	Solving linear equations (integer coefficients) using inverse operations involving pronumerals on both sides of the equation	• solve linear equations (integer coefficients) using inverse operations involving pronumerals on both sides of the equation
	2	Solving linear equations (integer, fraction or decimal coefficients) using inverse operations involving pronumerals on both sides of the equation	• solve linear equations (integer, fraction or decimal coefficients) using inverse operations involving pronumerals on both sides of the equation
Solving equations with variable on both sides	1	Solving linear equations (integer coefficients) using inverse operations involving expanding brackets	• solve linear equations (integer coefficients) using inverse operations involving expanding brackets
	2	Solving linear equations (integer, fraction or decimal coefficients) using inverse operations involving expanding brackets	• solve linear equations (integer, fraction or decimal coefficients) using inverse operations involving expanding brackets
Solving linear equations graphically	1	Solving linear equations using graphical techniques	• use graphs of linear relationships to solve a corresponding linear equation, with and without the use of digital technologies
	2	Graph two intersecting lines on the same set of axes and read off the point of intersection	• Use tables of values to plot two straight lines on a single cartesian plane • Read the point of intersection of two plotted straight lines on a single cartesian plane

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Understanding Practice and Fluency (UPF)

Number and Algebra

Linear and non-linear relationships

VCMNA285 Plot graphs of non-linear real life data with and without the use of digital technologies, and interpret and analyse these graphs			
Quest: Graphs of non-linear data			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Graphs of non-linear data	1	Exploring graphs of non-linear real life data with and without the use of digital technologies	• use digital technologies to graph non-linear relationships • interpret and analyse graphs of non-linear relationships
	2	Investigating different combinations of length and width of a rectangle for a fixed area, and drawing the corresponding graph	• investigate different combinations of length and width of a rectangle for a fixed area, and drawing the corresponding graph
		Using graphs to analyse change in the value of a currency against another currency over a specified period	• use graphs to analyse change in the value of a currency against another currency over a specified period

Victorian Curriculum Year 8

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Using units of measurement

VCMMG286 Choose appropriate units of measurement for area and volume and convert from one unit to another			
Quest: Units of area and volume			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Choosing and converting units of area	1	Choosing an appropriate unit to measure the areas of different shapes and surfaces	• choose an appropriate unit to measure the areas of different shapes and surfaces, eg floor space, fields
	2	Converting between different metric units of area (square millimetres, square centimetres, square metres, square kilometres, hectares)	• convert between square millimetres and square centimetres and vice versa • convert between square centimetres and square metres and vice versa • convert between square metres and hectares and vice versa • convert between square metres and square kilometres and vice versa
Choosing and converting units of volume	1	Choosing appropriate units to measure the capacities of a variety of containers	• choose appropriate units to measure the capacities of a variety of containers, eg millilitres for a drinking glass, litres for a water urn
	2	Converting between metric units of volume and capacity (ml, L, kL and ML)	• convert between metric units of volume: 1km^3 = 1000000m^3, 1m^3 = 10000cm^3, 1cm^3 = 1000mm^3 • convert between metric units of capacity: 1ML = 1000000L, 1kL = 1000L, 1L = 1000mL • "convert between metric units of volume and capacity: 1cm3 = 1mL, 1m^3 = 1000L"
VCMMG287 Find perimeters and areas of parallelograms, trapeziums, rhombuses and kites			
Quest: Perimeter and area of quadrilaterals			
Finding the perimeter	1	Finding perimeters of special quadrilaterals	• find the perimeter of parallelograms, trapeziums, rhombuses and kites • apply knowledge of geometric markings to find the perimeters of special quadrilaterals
	2	Solving problems involving perimeters of regular polygons	• solve problems involving the perimeters of regular polygons • solve problems involving perimeters of regular polygons with dimensions given in different units
	3	Solving problems involving perimeters of composite polygons	• solve problems involving perimeters of composite polygons formed using only triangles, squares, rectangles or parallelograms • solve problems involving perimeters of composite polygons formed using regular polygons • solve problems involving perimeters of composite polygons formed using only triangles, squares, rectangles or parallelograms with dimensions given in different units • solve problems involving perimeters of composite polygons formed using regular polygons with dimensions given in different units

Victorian Curriculum Year 8

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Using units of measurement

VCMMG287 Find perimeters and areas of parallelograms, trapeziums, rhombuses and kites			
Quest: Perimeter and area of quadrilaterals			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Solving area problems involving trapeziums	1	Finding the area of a trapezium using the formula	• apply the formula to find the areas of trapeziums of different orientations and shapes, including 4 unequal sides with no right angles, 2 right angles and isosceles trapezium • apply the formula to find the area of trapeziums in different orientations which include dimensions that are not necessary to calculate the area
	2	Finding the dimensions of a trapezium given its area	• find the dimensions of a trapezium given its area and 2 of either its height, roof or base by using the formula for the area of a trapezium • find the dimensions of a trapezium in different orientations given its area and 2 of either its height, roof or base by using the formula for the area of a trapezium
	3	Solving real-life problems involving calculating the area of trapeziums	• solve real-life problems involving calculating the area of trapeziums
Solving area problems involving rhombuses	1	Finding the area of a rhombus using the formula	• apply the formula to find the area of rhombuses in different orientations • apply the formula to find the area of rhombuses in different orientations which include dimensions that are not necessary to calculate the area
	2	Finding the dimensions of a rhombus given its area	• find the dimensions of a rhombus given its area by using the formula for the area of a rhombus • find the dimensions of a rhombus in different orientations given its area by using the formula for the area of a rhombus
	3	Solving real-life problems involving calculating the area of rhombus'	• solve real-life problems involving calculating the area of rhombus'
Solving area problems involving kites	1	Finding the area of a kite using the formula	• apply the formula to find the area of kites in different orientations • apply the formula to find the area of kites in different orientations which include dimensions that are not necessary to calculate the area
	2	Finding the dimensions of a kite given its area	• find the dimensions of a kite given its area and either its length or width by using the formula for the area of a kite • find the dimensions of a kite in different orientations given its area and either its length or width by using the formula for the area of a kite
	3	Solving real-life problems involving calculating the area of kites	• solve real-life problems involving calculating the area of kites

Victorian Curriculum Year 8

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Using units of measurement

VCMMG288 Investigate the relationship between features of circles such as circumference, area, radius and diameter. Use formulas to solve problems involving determining radius, diameter, circumference and area from each other			
Quest: Working with circles			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Identifying parts of circles	1	Identifying parts of a circle	• identify and apply circle definitions and properties, including: centre, radius, chord, diameter, circumference, tangent, arc, sector and segment
Working with circumferences of circles	1	Finding circumferences	• develop and use the formulas to find the circumferences of circles in terms of the diameter d or radius r
	2	Finding the diameter and/or radius of a circle given its circumference	• find the diameter and/or radius of a circle given its circumference
Finding perimeters of parts of circles	1	Finding the perimeters of quadrants and semicircles	• find the perimeters of quadrants and semicircles given the appropriate information • find the diameter and/or radius of a semicircle/ quadrant given the perimeter
	2	Finding the perimeters of simple composite figures	• find the perimeters of simple composite figures consisting of 2 shapes, including quadrants and semicircles
	3	Finding the perimeters of composite figures	• find the perimeters of composite figures containing 3 or more shapes consisting, including quadrants and semicircles
Finding arc lengths and perimeters of sectors	1	Finding arc lengths and the perimeters of sectors	• find the arc length of a sector • find the perimeter of a sector
	2	Solving problems involving perimeters of sectors	• find the diameter and/or radius of a sector given the arc length and angle • find the perimeters of complex composite figures • solve problems involving arcs and sectors
	3	Solving problems involving circles with exact answers	• solve a variety of practical problems involving circles and parts of circles, giving an exact answer in terms of π
		Solving problems involving circles with approximate answers	• solve a variety of practical problems involving circles and parts of circles, giving an approximate answer using a calculator's π function
Solving area problems involving circles	1	Finding the area of a circle using the formula	• apply the formula to find the areas of circles given the radius • apply the formula to find the areas of circles given the diameter
	2	Finding the dimensions of a circle given its area	• find the radius of a circle given its area using the formula for the area of a circle • find the diameter of a circle given its area using the formula for the area of circle
	3	Solving real-life problems involving calculating the area of circles	• solve real-life problems involving calculating the area of circles

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Understanding Practice and Fluency (UPF)

Measurement and Geometry

Using units of measurement

VCMMG288 Investigate the relationship between features of circles such as circumference, area, radius and diameter. Use formulas to solve problems involving determining radius, diameter, circumference and area from each other			
Quest: Working with circles			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Solving area problems involving parts of circles	1	Finding the area of a semicircle or quadrant of a circle	• find the area of a semicircle or quadrant of a circle • find the diameter or radius of a semicircle or quadrant given its area • find the diameter or radius of a semicircle or quadrant given its area within the context of a problem
	2	Applying the area of a sector formula with angle given in degrees: A=Θ/360*π*r^2	• find the area of a sector using the formula where radius is given and angle is given in degrees • find the radius of a sector using the formula where the area is given and angle is given in degrees • find the angle of a sector in degrees using the formula where the area and radius are given • find the unknown variable using the area of a sector formula in the context of a problem in degrees
	3	Finding the area of composite shapes involving circles, semicircles and quadrants	• find the area of composite shapes involving circles, semicircles and quadrants • find the area of composite shapes involving circles, semicircles and quadrants within the context of a problem
	4	Finding the area of composite shapes involving circles, semicircles and quadrants giving an exact answer in terms of pi	• find the area of composite shapes involving circles, semicircles and quadrants giving an exact answer in terms of pi • find the area of composite shapes involving circles, semicircles and quadrants within the context of a problem giving an exact answer in terms of pi

Victorian Curriculum Year 8

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Using units of measurement

VCMMG289 Develop the formulas for volumes of rectangular and triangular prisms and prisms in general. Use formulas to solve problems involving volume			
Quest: Working with prisms			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Finding the volume of prisms	1	Developing methods and formulas to find the volume of any prism	• recognise the area of the 'base' of a prism as being identical to the area of its uniform cross-section
	2	Finding the volume of prism with a composite/irregular polygon uniform cross-section, given their perpendicular heights and area of their cross-sections all in the same units	• find the volume of prism with a composite/ irregular polygon uniform cross-section, given their perpendicular heights and area of their cross-sections all in the same units
	3	Finding the volume of prism with a composite/irregular polygon with uniform cross-section, given their perpendicular heights and dimensions of the cross-sections all in the same units	• find the volume of prism with a composite/irregular polygon with uniform cross-section, given their perpendicular heights and dimensions of the cross-sections all in the same units
	4	Finding the volume of prism with a composite/irregular polygon uniform cross-section, given their perpendicular heights and area of their cross-sections all in different units	• find the volume of prism with a composite/ irregular polygon uniform cross-section, given their perpendicular heights and area of their cross-sections all in different units
	5	Finding the volume of prism with a composite/irregular polygon with uniform cross-section, given their perpendicular heights and dimensions of the cross-sections all in different units	• find the volume of prism with a composite/irregular polygon with uniform cross-section, given their perpendicular heights and dimensions of the cross-sections all in different units
Finding the volume of rectangular prisms	1	Finding the volumes of rectangular prisms, given their perpendicular heights and the dimensions of their uniform cross-sections	• find the volumes of rectangular prisms, given their perpendicular heights and the dimensions of their uniform cross-sections
		Finding the volume of a rectangular prism given the area of the uniform cross-section and perpendicular height in the same units	• find the volume of a rectangular prism given the area of the uniform cross-section and perpendicular height in the same units
	2	Finding the volume of a rectangular prism given the area of the uniform cross-section and perpendicular height in different units	• find the volume of a rectangular prism given the area of the uniform cross-section and perpendicular height in different units
	3	Finding the height or area of the uniform cross-section given the volume in the same units	• find the height or area of the uniform cross-section given the volume in the same units
	4	Finding the height/area of the uniform cross-section given the volume in different units	• find the height/area of the uniform cross-section given the volume in different units
		Finding a missing dimension of a rectangular prism given the volume in different units	• find a missing dimension of a rectangular prism given the volume in different units

Victorian Curriculum Year 8

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Using units of measurement

VCMMG289 Develop the formulas for volumes of rectangular and triangular prisms and prisms in general. Use formulas to solve problems involving volume			
Quest: Working with prisms			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Finding the volume of triangular prisms	1	Finding the volume of a triangular prism given the area of the uniform cross-section and perpendicular height in the same units	• find the volume of a triangular prism given the area of the uniform cross-section and perpendicular height in the same units
		Finding the volume of triangular prisms, given their perpendicular heights and dimensions of their uniform cross-sections all in the same units	• find the volume of triangular prisms, given their perpendicular heights and dimensions of their uniform cross-sections all in the same units
	2	Finding the volume of a triangular prism given the area of the uniform cross-section and perpendicular height in different units	• find the volume of a triangular prism given the area of the uniform cross-section and perpendicular height in different units
		Finding the volume of triangular prisms, given their perpendicular heights and dimensions of their uniform cross-sections all in different units	• find the volume of triangular prisms, given their perpendicular heights and dimensions of their uniform cross-sections all in different units
	3	Finding the volume of triangular prisms, given their perpendicular heights, dimensions of their uniform cross-sections and additional measurements not required for the calculation in the same/ different units	• find the volume of triangular prisms, given their perpendicular heights, dimensions of their uniform cross-sections and additional measurements not required for the calculation in the same/ different units
	4	Finding a missing dimension of a triangular prism given the volume in the same units	• find a missing dimension of a triangular prism given the volume in the same units
		Finding a missing dimension of a triangular prism given the volume in different units	• find a missing dimension of a triangular prism given the volume in different units
Solving problems involving prisms	1	Solving a variety of practical problems involving the volumes and capacities of right prisms	• solve a variety of practical problems involving the volumes and capacities of right prisms • find the height or area of a prism with a composite/ irregular polygon with uniform cross-section given the volume in the same units • find the height or area of a prism with a composite/ irregular polygon with uniform cross-section given the volume in different units

Victorian Curriculum Year 8

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Using units of measurement

VCMMG290 Solve problems involving duration, including using 12- and 24-hour time within a single time zone			
Quest: Solve problems involving time			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Solving problems involving time	1	Ordering a series of events according to the time taken to complete each one	• order a series of events according to the time taken to complete each one
	2	Calculating the elapsed time of events using start and finish times using only 12-hour time	• calculate the elapsed time of events using start and finish times using only 12-hour time
		Calculating the elapsed time of events using start and finish times using 12-hour and 24-hour time	• calculate the elapsed time of events using start and finish times using 12-hour and 24-hour time
	3	Calculating the starting time of events given the elapsed time and the finishing time using only 12-hour time	• calculate the starting time of events given the elapsed time and the finishing time using only 12-hour time
		Calculating the starting time of events given the elapsed time and the finishing time using 12-hour and 24-hour time	• calculate the starting time of events given the elapsed time and the finishing time using 12-hour and 24-hour time
	4	Calculating the finishing time of events given the elapsed time and the finish times using only 12-hour time	• calculate the finishing time of events given the elapsed time and the finish times using only 12-hour time
		Calculating the finishing time of events given the elapsed time and the finish times using only 12-hour and 24-hour time	• calculate the finishing time of events given the elapsed time and the finish times using 12-hour and 24-hour time
	5	Solving problems within a given context involving starting and finishing times of events and elapsed time using only 12-hour time	• solve problems within a given context involving starting and finishing times of events and elapsed time using only 12-hour time
		Solving problems within a given context involving starting and finishing times of events and elapsed time using 12-hour and 24-hour time	• solve problems within a given context involving starting and finishing times of events and elapsed time using 12-hour and 24-hour time
Rounding and converting time	1	Introducing the calculator button degrees, minutes, seconds	• add and subtract time using the 'degrees-minutes-seconds' button on the calculator
	2	Rounding time measurements to the nearest hour, minute or second	• round time measurements to the nearest hour, minute or second
	3	Converting time given in decimal form into hours, minutes and seconds	• convert time given in decimal form into hours, minutes and seconds
	4	Converting time given in hours, minutes and seconds into decimal form	• convert time given in hours, minutes and seconds into decimal form

Victorian Curriculum Year 8

Understanding Practice and Fluency (UPF)

Measurement and Geometry

Geometric reasoning

Learning Journey	Steps	Spine Nodes	Subnodes
VCMMG291 Define congruence of plane shapes using transformations and use transformations of congruent shapes to produce regular patterns in the plane including tessellations with and without the use of digital technology			
Quest: Congruence, patterns and tessellation's			
Defining and working with congruence	1	Identifying congruent figures by superimposing them through a combination of rotations, reflections and translations	• identify congruent figures by superimposing them through a combination of rotations, reflections and translations
	2	Matching sides and angles of 2 congruent polygons	• determine which angles and sides of a polygon are matched to another polygon's sides and angles
	3	Determining the condition for 2 circles or parts of circles to be congruent	• determine when 2 circles are congruent according to their radii/diameters • determine when 2 semi-circles are congruent according to their radii/diameters • determine when 2 sectors are congruent according to equal internal angles at the centre and radii/ diameters
Patterns and Tessellation: Congruent Shapes	1	Using transformations of congruent shapes to produce regular patterns in the plane including tessellations	• use transformations of congruent shapes to produce regular patterns in the plane • use transformations of congruent shapes to produce tessallations in the plane
VCMMG292 Develop the conditions for congruence of triangles			
Quest: Determining congruence in triangles			
Determining congruence in triangles	1	Determining if 2 triangles are congruent using the SSS test	• use the SSS test to determine if 2 or more triangles are congruent
	2	Determining if 2 triangles are congruent using the SAS test	• use the SAS test to determine if 2 or more triangles are congruent
	3	Determining if 2 triangles are congruent using the AAS test	• use the AAS test to determine if 2 or more triangles are congruent
	4	Determining if 2 triangles are congruent using the RHS test	• use the RHS test to determine if 2 or more triangles are congruent
	5	Determining if 2 triangles are congruent using the SSS, SAS, AAS and RHS test	• use the SSS, SAS, AAS and RHS tests to determine if 2 or more triangles are congruent
		Using the congruency tests to identify a pair of congruent triangles from a selection of 3 or more triangles or from triangles embedded in a diagram	• use the congruency tests (SSS, SAS, AAS, RHS) to identify a pair of congruent triangles from a selection of 3 or more triangles or from triangles embedded in a diagram
VCMMG293 Establish properties of quadrilaterals using congruent triangles and angle properties, and solve related numerical problems using reasoning			
Quest: Using properties of congruent triangles			
Determining congruence in triangles	1	Applying the properties of congruent triangles to find an unknown side and/ or angle in a diagram, giving a reason	• apply the properties of congruent triangles to determine a missing angle or length by observing a congruent triangle that has the matching length or angle

Victorian Curriculum Year 8

Understanding Practice and Fluency (UPF)

Statistics and Probability

Chance

Learning Journey	Steps	Spine Nodes	Subnodes
VCMSP294 Identify complementary events and use the sum of probabilities to solve problems			
Quest: Complementary events			
Complementary events	1	Understanding the term 'complement' to describe events that are mutually exclusive and add to 1	• understand the term 'complement' to describe events that are mutually exclusive and add to 1
	2	Finding the complement of an event	• find the probability of the complement of an event by using the fact that the sum of the probabilities of an event and its complement is 1
	3	Identifying the complementary event for a given event, and calculating the theoretical probability that a given event will not occur	• identify the complementary event for given event, and calculate the theoretical probability that a given event will not occur • describe in words the complement of an event
VCMSP295 Describe events using language of 'at least', exclusive 'or' (A or B but not both), inclusive 'or' (A or B or both) and 'and'			
Quest: Probability language to describe events			
Probability language to describe events	1	Describing events using language of 'at least', exclusive 'or' (A or B but not both), inclusive 'or' (A or B or both) and 'and' (both A and B)	• describe events using language of 'at least', exclusive 'or' (A or B but not both), inclusive 'or' (A or B or both) and 'and' (both A and B) • recognise the difference between mutually exclusive and non-mutually exclusive events
	2	Describing compound events using the terms 'at least', 'at most', 'not' and 'and'	• describe compound events using the terms 'at least', 'at most', 'not' and 'and'
	3	Posing problems that involve the use of the terms 'at least', 'at most', 'not', 'and' and solve problems posed by others	• solve problems posed by others that involve the use of the terms 'at least', 'at most', 'not', 'and'
	4	Classifying compound events	• classify compound events using inclusive 'or' and exclusive 'or'
VCMSP296 Represent events in two-way tables and Venn diagrams and solve related problems			
Quest: Venn diagrams and Two-Way tables			
Understanding and contructing Venn diagrams	1	Interpreting Venn diagrams involving two or three mutually exclusive attributes	• interpret Venn diagrams involving two or three mutually exclusive attributes • describe regions in Venn diagrams representing mutually exclusive attributes
	2	Interpreting Venn diagrams involving two or three non- mutually exclusive attributes	• interpret Venn diagrams involving two or three non-mutually exclusive attributes • describe individual regions or combinations of regions in Venn diagrams representing non-mutually exclusive attributes, using the language 'and', exclusive 'or', inclusive 'or', 'neither' and 'not'
	3	Representing events in Venn diagrams	• represent events of 2 or 3 attributes using Venn diagrams
		Constructing Venn diagrams to represent all possible combinations of 2 attributes from given or collected data	• construct Venn diagrams to represent all possible combinations of 2 attributes from given or collected data

Victorian Curriculum Year 8

Understanding Practice and Fluency (UPF)

Statistics and Probability

Chance

VCMSP296 Represent events in two-way tables and Venn diagrams and solve related problems			
Quest: Venn diagrams and Two-Way tables			
Learning Journey	**Steps**	**Spine Nodes**	**Subnodes**
Using Venn diagrams to solve problems	1	Using data presented in venn diagrams to answer problems, including probability questions	• use data presented in venn diagrams to answer problems, including probability questions
	2	Using given data to calculate missing values in a Venn diagram	• use given data to calculate missing values in a Venn diagram
	3	Using data presented in venn diagrams to answer problems where missing values must first be found, including probability questions	• use data presented in venn diagrams to answer problems where missing values must first be found, including probability questions
Interpreting and constructing two-way tables	1	Interpreting given two-way tables representing non-mutually exclusive attributes	• interpret given two-way tables representing non-mutually exclusive attributes • describe relationships displayed in two-way tables using the language 'and', exclusive 'or', inclusive 'or', 'neither' and 'not'
	2	Constructing two-way tables to represent the relationships between attributes	• construct two-way tables to represent the relationships between attributes
	3	Using data presented in two-way tables to answer problems, including probability questions	• use data presented in a two-way table to answer problems, including probability questions
	4	Using given data to calculate missing values in a two-way table	• use given data to calculate missing values in a two-way table
	5	Using data presented in two-way tables to answer problems where missing values must first be found, including probability questions	• use data presented in two-way tables to answer problems where missing values must first be found, including probability questions
Two-way tables and Venn diagrams	1	Converting between representations of the relationships between 2 attributes in Venn diagrams and two-way tables	• convert between representations of the relationships between 2 attributes in Venn diagrams and two-way tables

Victorian Curriculum Year 8

Understanding Practice and Fluency (UPF)

Statistics and Probability

Data representation and interpretation

Learning Journey	Steps	Spine Nodes	Subnodes
VCMSP297 Distinguish between a population and a sample and investigate techniques for collecting data, including census, sampling and observation			
Quest: Collecting data			
Collecting data	1	Classifying data/recognising variables as categorical (qualitative) or numerical (quantitative) - either discrete or continuous	• identify examples of categorical variables (eg colour, gender) discrete numerical variables (eg number of students, shoe size) and continuous numerical variables (eg height, weight)
	2	Recognising and explaining the difference between a 'population' and a 'sample' selected from a population when collecting data	• recognise and explain the difference between a 'population' and a 'sample' selected from a population when collecting data
	3	Investigating and determine the differences between collecting data by observation, census and sampling	• identify examples of variables for which data could be collected by observation, eg direction travelled by vehicles arriving at an intersection, native animals in a local area • identify examples of variables for which data could be collected by a census or by a sample, eg a census to collect data about the income of Australians, a sample for TV ratings
VCMSP298 Explore the practicalities and implications of obtaining data through sampling using a variety of investigative processes			
Quest: Data sampling and populations			
The relationship between a sample & the population	1	Using samples to make predictions about a larger 'population' from which the sample comes	• use samples to make predictions about a larger 'population' from which the sample comes
	2	Inferring properties of populations or distributions from a sample, whilst knowing the limitations of sampling	• infer properties of populations or distributions from a sample, whilst knowing the limitations of sampling
VCMSP299 Explore the variation of means and proportions of random samples drawn from the same population			
VCMSP300 Investigate the effect of individual data values including outliers, on the range, mean and median 4432452			
Quest: Clusters, gaps and outliers in data			
Clusters, gaps and outliers in data	1	Identifying any clusters, gaps and outliers in sets of data	• identify any clusters, gaps and outliers in sets of data • identify any clusters, gaps and outliers in sets of data when represented in different displays
	2	Investigating the effect of outliers on the mean, median, mode and range by considering a small set of data and calculating each measure, with and without the inclusion of an outlier	• investigate the effect of outliers on the mean, median, mode and range by considering a small set of data and calculating each measure, with and without the inclusion of an outlier

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