AusVELS TO GO

PRIMARY MATHEMATICS

Based on Australian Curriculum, Assessment and Reporting Authority (ACARA) materials

Optimised for double-sided printing

- ➢ **CONTENT STRUCTURE**

- ➢ **PROFICIENCY STRANDS / Level Descriptions** *(Foundation – Level 6)*

- ➢ **CONTENT STRANDS**

- ➢ **SCOPE AND SEQUENCES – Content Strands** *(Foundation – Level 6)*
  Number and Algebra
  Measurement and Geometry
  Statistics and Probability

- ➢ **LEVEL OVERVIEWS** *(Foundation – Level 6)*

- ➢ **QUICK GUIDES** *(Foundation – Level 7)*
  Content Descriptions
  Elaborations
  Progression Points (from the VCAA)
  Achievement Standards

KEY COMPONENTS OF AUSVELS

Content descriptions:
- describe the knowledge, concepts, skills and processes that teachers are expected to teach and students are expected to learn
- do not prescribe approaches to teaching
- are intended to ensure that learning is appropriately ordered and that unnecessary repetition is avoided
- include skills and concepts that may be revisited, strengthened and extended at later levels as needed

Elaborations:
- are provided to illustrate and exemplify content
- assist teachers to develop a common understanding of the content descriptions
- are not intended to be comprehensive content points that all students need to be taught

Progression points: *(Sourced from the VCAA)*
- assist teachers in the assessment and reporting of student achievement by illustrating how a student might show evidence of progression
- can be modified by schools to reflect curriculum structure and timing of when knowledge and skills are taught and assessed
- should be used in conjunction with other tools such as annotated student work samples
- are not to be used as a definitive or mandated set of progression measures for student assessment

Achievement standards:
- describe the quality of learning (the extent of knowledge, the depth of understanding, and the sophistication of skills) that students should typically demonstrate by a particular point in their schooling, and that would indicate the student is well placed to commence the learning required at the next level of achievement
- comprise a written description and student work samples

The Australian Curriculum: Mathematics is organised around the interaction of <u>three content strands</u> and <u>four proficiency strands</u>.

Content strands describe what is to be taught and learnt. They are:
- *Number and Algebra*
- *Measurement and Geometry*
- *Statistics and Probability*

Content descriptions within these content strands are grouped into sub-strands to illustrate the clarity and sequence of development of concepts through and across the levels. They support the ability to see the connections across strands and the sequential development of concepts from Foundation to Level 10.

Proficiency strands describe how content is explored or developed, that is, the thinking and doing of mathematics. They are:
- *Understanding*
- *Fluency*
- *Problem Solving*
- *Reasoning*

They provide the language to build in the developmental aspects of the learning of mathematics and have been incorporated into the content descriptions of the three content strands described above. This approach has been adopted to ensure students' proficiency in mathematical skills develops throughout the curriculum and becomes increasingly sophisticated over the levels of schooling.

PROFICIENCY STRANDS →	Understanding, Fluency, Problem Solving, Reasoning		
CONTENT STRANDS →	**Number and Algebra**	**Measurement and Geometry**	**Statistics and Probability**
SUB-STRANDS →	*Number and place value (F-8)* *Fractions and decimals (1-6)* *Real numbers (7-10)* *Money and financial mathematics (1-10)* *Patterns and algebra (F-10)* *Linear and non-linear relationships (7-10)*	*Using units of measurement (F-10)* *Shape (F-7)* *Geometric reasoning (3-10)* *Location and transformation (F-7)* *Pythagoras and trigonometry (9-10)*	*Chance (1-10)* *Data representation and interpretation (F-10)*

The proficiency strands describe the actions in which students can engage when learning and using the content. While not all proficiency strands apply to every content description, they indicate the breadth of mathematical actions that teachers can emphasise. They are represented across and within the Level Descriptions, Content Descriptions and Achievement Standards.

Understanding

Students build a robust knowledge of adaptable and transferable mathematical concepts. They make connections between related concepts and progressively apply the familiar to develop new ideas. They develop an understanding of the relationship between the 'why' and the 'how' of mathematics. Students build understanding when they connect related ideas, when they represent concepts in different ways, when they identify commonalities and differences between aspects of content, when they describe their thinking mathematically and when they interpret mathematical information.

Fluency

Students develop skills in choosing appropriate procedures, carrying out procedures flexibly, accurately, efficiently and appropriately, and recalling factual knowledge and concepts readily. Students are fluent when they calculate answers efficiently, when they recognise robust ways of answering questions, when they choose appropriate methods and approximations, when they recall definitions and regularly use facts, and when they can manipulate expressions and equations to find solutions.

Problem Solving

Students develop the ability to make choices, interpret, formulate, model and investigate problem situations, and communicate solutions effectively. Students formulate and solve problems when they use mathematics to represent unfamiliar or meaningful situations, when they design investigations and plan their approaches, when they apply their existing strategies to seek solutions, and when they verify that their answers are reasonable.

Reasoning

Students develop an increasingly sophisticated capacity for logical thought and actions, such as analysing, proving, evaluating, explaining, inferring, justifying and generalising. Students are reasoning mathematically when they explain their thinking, when they deduce and justify strategies used and conclusions reached, when they adapt the known to the unknown, when they transfer learning from one context to another, when they prove that something is true or false and when they compare and contrast related ideas and explain their choices.

Level Descriptions			
The proficiency strands are an integral part of mathematics content across all strands. The proficiencies reinforce the significance of working mathematically within the content and describe how the content is explored or developed. They provide the language to build in the developmental aspects of the learning of mathematics			

	UNDERSTANDING	FLUENCY	PROBLEM SOLVING	REASONING
Foundation	Understanding includes connecting names, numerals and quantities	Fluency includes readily counting numbers in sequences, continuing patterns, and comparing the lengths of objects	Problem Solving includes using materials to model authentic problems, sorting objects, using familiar counting sequences to solve unfamiliar problems, and discussing the reasonableness of the answer	Reasoning includes explaining comparisons of quantities, creating patterns, and explaining processes for indirect comparison of length
Level 1	Understanding includes connecting names, numerals and quantities, and partitioning numbers in various ways	Fluency includes counting number in sequences readily forward and backwards, locating numbers on a line, and naming the days of the week	Problem Solving includes using materials to model authentic problems, giving and receiving directions to unfamiliar places, and using familiar counting sequences to solve unfamiliar problems and discussing the reasonableness of the answer	Reasoning includes explaining direct and indirect comparisons of length using uniform informal units, justifying representations of data, and explaining patterns that have been created
Level 2	Understanding includes connecting number calculations with counting sequences, partitioning and combining numbers flexibly, identifying and describing the relationship between addition and subtraction and between multiplication and division	Fluency includes counting numbers in sequences readily, using informal units iteratively to compare measurements, using the language of chance to describe outcomes of familiar chance events and describing and comparing time durations	Problem Solving includes formulating problems from authentic situations, making models and using number sentences that represent problem situations, and matching transformations with their original shape	Reasoning includes using known facts to derive strategies for unfamiliar calculations, comparing and contrasting related models of operations, and creating and interpreting simple representations of data
Level 3	Understanding includes connecting number representations with number sequences, partitioning and combining numbers flexibly, representing unit fractions, using appropriate language to communicate times, and identifying environmental symmetry	Fluency includes recalling multiplication facts, using familiar metric units to order and compare objects, identifying and describing outcomes of chance experiments, interpreting maps and communicating positions	Problem Solving includes formulating and modelling authentic situations involving planning methods of data collection and representation, making models of three-dimensional objects and using number properties to continue number patterns	Reasoning includes using generalising from number properties and results of calculations, comparing angles, creating and interpreting variations in the results of data collections and data displays
Level 4	Understanding includes making connections between representations of numbers, partitioning and combining numbers flexibly, extending place value to decimals, using appropriate language to communicate times, and describing properties of symmetrical shapes	Fluency includes recalling multiplication tables, communicating sequences of simple fractions, using instruments to measure accurately, creating patterns with shapes and their transformations, and collecting and recording data	Problem Solving includes formulating, modelling and recording authentic situations involving operations, comparing large numbers with each other, comparing time durations, and using properties of numbers to continue patterns	Reasoning includes using generalising from number properties and results of calculations, deriving strategies for unfamiliar multiplication and division tasks, comparing angles, communicating information using graphical displays and evaluating the appropriateness of different displays
Level 5	Understanding includes making connections between representations of numbers, using fractions to represent probabilities, comparing and ordering fractions and decimals and representing them in various ways, describing transformations and identifying line and rotational symmetry	Fluency includes choosing appropriate units of measurement for calculation of perimeter and area, using estimation to check the reasonableness of answers to calculations and using instruments to measure angles	Problem Solving includes formulating and solving authentic problems using whole numbers and measurements and creating financial plans	Reasoning includes investigating strategies to perform calculations efficiently, continuing patterns involving fractions and decimals, interpreting results of chance experiments, posing appropriate questions for data investigations and interpreting data sets
Level 6	Understanding includes describing properties of different sets of numbers, using fractions and decimals to describe probabilities, representing fractions and decimals in various ways and describing connections between them, and making reasonable estimations	Fluency includes representing integers on a number line, calculating simple percentages, using brackets appropriately, converting between fractions and decimals, using operations with fractions, decimals and percentages, measuring using metric units, and interpreting timetables	Problem Solving includes formulating and solving authentic problems using fractions, decimals, percentages and measurements, interpreting secondary data displays, and finding the size of unknown angles	Reasoning includes explaining mental strategies for performing calculations, describing results for continuing number sequences, explaining the transformation of one shape into another, explaining why the actual results of chance experiments may differ from expected results

Number and Algebra

Number and Algebra are developed together, as each enriches the study of the other. Students apply number sense and strategies for counting and representing numbers. They explore the magnitude and properties of numbers. They apply a range of strategies for computation and understand the connections between operations. They recognise patterns and understand the concepts of variable and function. They build on their understanding of the number system to describe relationships and formulate generalisations. They recognise equivalence and solve equations and inequalities. They apply their number and algebra skills to conduct investigations, solve problems and communicate their reasoning.

Measurement and Geometry

Measurement and Geometry are presented together to emphasise their relationship to each other, enhancing their practical relevance. Students develop an increasingly sophisticated understanding of size, shape, relative position and movement of two-dimensional figures in the plane and three-dimensional objects in space. They investigate properties and apply their understanding of them to define, compare and construct figures and objects. They learn to develop geometric arguments. They make meaningful measurements of quantities, choosing appropriate metric units of measurement. They build an understanding of the connections between units and calculate derived measures such as area, speed and density.

Statistics and Probability

Statistics and Probability initially develop in parallel and the curriculum then progressively builds the links between them. Students recognise and analyse data and draw inferences. They represent, summarise and interpret data and undertake purposeful investigations involving the collection and interpretation of data. They assess likelihood and assign probabilities using experimental and theoretical approaches. They develop an increasingly sophisticated ability to critically evaluate chance and data concepts and make reasoned judgments and decisions, as well as building skills to critically evaluate statistical information and develop intuitions about data.

SCOPE AND SEQUENCES

Foundation – Level 6

Content descriptions for each of the three content strands, showing the sequence of learning across each sub-strand.

Foundation	Level 1	Level 2	Level 3
NUMBER AND PLACE VALUE (F-8)			
Establish understanding of the language and processes of counting by naming numbers in sequences, initially to and from 20, moving from any starting point

Connect number names, numerals and quantities, including zero, initially up to 10 and then beyond

Subitise small collections of objects

Compare, order and make correspondences between collections, initially to 20, and explain reasoning

Represent practical situations to model addition and sharing | 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

Recognise, model, read, write and order numbers to at least 100. Locate these numbers on a number line.

Count collections to 100 by partitioning numbers using place value

Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts | Investigate number sequences, initially those increasing and decreasing by twos, threes, fives and ten from any starting point, then moving to other sequences

Recognise, model, represent and order numbers to at least 1000

Group, partition and rearrange collections up to 1000 in hundreds, tens and ones to facilitate more efficient counting

Explore the connection between addition and subtraction

Solve simple addition and subtraction problems using a range of efficient mental and written strategies

Recognise and represent multiplication as repeated addition, groups and arrays

Recognise and represent division as grouping into equal sets and solve simple problems using these representations | Investigate the conditions required for a number to be odd or even and identify odd and even numbers

Recognise, model, represent and order numbers to at least 10 000

Apply place value to partition, rearrange and regroup numbers to at least 10 000 to assist calculations and solve problems

Recognise and explain the connection between addition and subtraction

Recall addition facts for single-digit numbers and related subtraction facts to develop increasingly efficient mental strategies for computation

Recall multiplication facts of two, three, five and ten and related division facts

Represent and solve problems involving multiplication using efficient mental and written strategies and appropriate digital technologies |
| **FRACTIONS AND DECIMALS (1-6)** | | | |
| | Recognise and describe one-half as one of two equal parts of a whole | Recognise and interpret common uses of halves, quarters and eighths of shapes and collections | Model and represent unit fractions

including 1/2, 1/4, 1/3, 1/5 and their multiples to a complete whole |
MONEY AND FINANCIAL MATHEMATICS (1-10)			
	Recognise, describe and order Australian coins according to their value	Count and order small collections of Australian coins and notes according to their value	Represent money values in multiple ways and count the change required for simple transactions to the nearest five cents
PATTERNS AND ALGEBRA (F-10)			
Sort and classify familiar objects and explain the basis for these classifications. Copy, continue and create patterns with objects and drawings	Investigate and describe number patterns formed by skip counting and patterns with objects	Describe patterns with numbers and identify missing elements

Solve problems by using number sentences for addition or subtraction | Describe, continue, and create number patterns resulting from performing addition or subtraction |

Level 4	Level 5	Level 6
NUMBER AND PLACE VALUE (F-8)		
Investigate and use the properties of odd and even numbers Recognise, represent and order numbers to at least tens of thousands Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problems Investigate number sequences involving multiples of 3, 4, 6, 7, 8, and 9 Recall multiplication facts up to 10 × 10 and related division facts Develop efficient mental and written strategies and use appropriate digital technologies for multiplication and for division where there is no remainder	Identify and describe factors and multiples of whole numbers and use them to solve problems Use estimation and rounding to check the reasonableness of answers to calculations Solve problems involving multiplication of large numbers by one- or two-digit numbers using efficient mental, written strategies and appropriate digital technologies Solve problems involving division by a one digit number, including those that result in a remainder Use efficient mental and written strategies and apply appropriate digital technologies to solve problems	Identify and describe properties of prime, composite, square and triangular numbers Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers Investigate everyday situations that use integers. Locate and represent these numbers on a number line
FRACTIONS AND DECIMALS (1-6)		
Investigate equivalent fractions used in contexts Count by quarters halves and thirds, including with mixed numerals. Locate and represent these fractions on a number line Recognise that the place value system can be extended to tenths and hundredths. Make connections between fractions and decimal notation	Compare and order common unit fractions and locate and represent them on a number line Investigate strategies to solve problems involving addition and subtraction of fractions with the same denominator Recognise that the place value system can be extended beyond hundredths Compare, order and represent decimals	Compare fractions with related denominators and locate and represent them on a number line Solve problems involving addition and subtraction of fractions with the same or related denominators Find a simple fraction of a quantity where the result is a whole number, with and without digital technologies Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without digital technologies Multiply and divide decimals by powers of 10 Make connections between equivalent fractions, decimals and percentages
MONEY AND FINANCIAL MATHEMATICS (1-10)		
Solve problems involving purchases and the calculation of change to the nearest five cents with and without digital technologies	Create simple financial plans	Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies
PATTERNS AND ALGEBRA (F-10)		
Explore and describe number patterns resulting from performing multiplication Solve word problems by using number sentences involving multiplication or division where there is no remainder Use equivalent number sentences involving addition and subtraction to find unknown quantities	Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction Use equivalent number sentences involving multiplication and division to find unknown quantities	Continue and create sequences involving whole numbers, fractions and decimals. Describe the rule used to create the sequence Explore the use of brackets and order of operations to write number sentences

MATHEMATICS   SCOPE AND SEQUENCE: Measurement and Geometry   F-6 Content

Foundation	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
USING UNITS OF MEASUREMENT (F-10)						
Use direct and indirect comparisons to decide which is longer, heavier or holds more, and explain reasoning in everyday language Compare and order the duration of events using the everyday language of time Connect days of the week to familiar events and actions	Measure and compare the lengths and capacities of pairs of objects using uniform informal units Tell time to the half-hour Describe duration using months, weeks, days and hours	Compare and order several shapes and objects based on length, area, volume and capacity using appropriate uniform informal units Compare masses of objects using balance scales Tell time to the quarter-hour, using the language of 'past' and 'to' Name and order months and seasons Use a calendar to identify the date and determine the number of days in each month	Measure, order and compare objects using familiar metric units of length, mass and capacity Tell time to the minute and investigate the relationship between units of time	Use scaled instruments to measure and compare lengths, masses, capacities and temperatures Compare objects using familiar metric units of area and volume Convert between units of time Use am and pm notation and solve simple time problems	Choose appropriate units of measurement for length, area, volume, capacity and mass Calculate the perimeter and area of rectangles using familiar metric units Compare 12- and 24-hour time systems and convert between them	Connect decimal representations to the metric system Convert between common metric units of length, mass and capacity Solve problems involving the comparison of lengths and areas using appropriate units Connect volume and capacity and their units of measurement Interpret and use timetables
SHAPE (F-7)						
Sort, describe and name familiar two-dimensional shapes and three-dimensional objects in the environment	Recognise and classify familiar two-dimensional shapes and three-dimensional objects using obvious features	Describe and draw two-dimensional shapes, with and without digital technologies Describe the features of three-dimensional objects	Make models of three-dimensional objects and describe key features	Compare the areas of regular and irregular shapes by informal means Compare and describe two dimensional shapes that result from combining and splitting common shapes, with and without the use of digital technologies	Connect three-dimensional objects with their nets and other two-dimensional representations	Construct simple prisms and pyramids
LOCATION AND TRANSFORMATION (F-7)						
Describe position and movement	Give and follow directions to familiar locations	Interpret simple maps of familiar locations and identify the relative positions of key features Investigate the effect of one-step slides and flips with and without digital technologies Identify and describe half and quarter turns	Create and interpret simple grid maps to show position and pathways Identify symmetry in the environment	Use simple scales, legends and directions to interpret information contained in basic maps Create symmetrical patterns, pictures and shapes with and without digital technologies	Use a grid reference system to describe locations. Describe routes using landmarks and directional language Describe translations, reflections and rotations of two-dimensional shapes. Identify line and rotational symmetries Apply the enlargement transformation to familiar two dimensional shapes and explore the properties of the resulting image compared with the original	Investigate combinations of translations, reflections and rotations, with and without the use of digital technologies Introduce the Cartesian coordinate system using all four quadrants
GEOMETRIC REASONING (3-10)						
			Identify angles as measures of turn and compare angle sizes in everyday situations	Compare angles and classify them as equal to, greater than or less than a right angle	Estimate, measure and compare angles using degrees. Construct angles using a protractor	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

Moorabbin Primary School

Foundation	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
CHANCE (1-10)						
	Identify outcomes of familiar events involving chance and describe them using everyday language such as 'will happen', 'won't happen' or 'might happen'	Identify practical activities and everyday events that involve chance. Describe outcomes as 'likely' or 'unlikely' and identify some events as 'certain' or 'impossible'	Conduct chance experiments, identify and describe possible outcomes and recognise variation in results	Describe possible everyday events and order their chances of occurring Identify everyday events where one cannot happen if the other happens Identify events where the chance of one will not be affected by the occurrence of the other	List outcomes of chance experiments involving equally likely outcomes and represent probabilities of those outcomes using fractions Recognise that probabilities range from 0 to 1	Describe probabilities using fractions, decimals and percentages Conduct chance experiments with both small and large numbers of trials using appropriate digital technologies Compare observed frequencies across experiments with expected frequencies
DATA REPRESENTATION AND INTERPRETATION (F-10)						
Answer yes/no questions to collect information	Choose simple questions and gather responses Represent data with objects and drawings where one object or drawing represents one data value. Describe the displays	Identify a question of interest based on one categorical variable. Gather data relevant to the question Collect, check and classify data Create displays of data using lists, table and picture graphs and interpret them	Identify questions or issues for categorical variables. Identify data sources and plan methods of data collection and recording 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 Interpret and compare data displays	Select and trial methods for data collection, including survey questions and recording sheets 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 Evaluate the effectiveness of different displays in illustrating data features including variability	Pose questions and collect categorical or numerical data by observation or survey Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies Describe and interpret different data sets in context	Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables Interpret secondary data presented in digital media and elsewhere

LEVEL

OVERVIEWS

Foundation – Level 6

Content descriptions from all three content strands, grouped according to level.

MATHEMATICS　　　　LEVEL OVERVIEW　　　　Foundation

Number and Algebra		Term 1	Term 2	Term 3	Term 4
Number and place value	Establish understanding of the language and processes of counting by naming numbers in sequences, initially to and from 20, moving from any starting point				
	Connect number names, numerals and quantities, including zero, initially up to 10 and then beyond				
	Subitise small collections of objects				
	Compare, order and make correspondences between collections, initially to 20, and explain reasoning				
	Represent practical situations to model addition and sharing				
Patterns and algebra	Sort and classify familiar objects and explain the basis for these classifications. Copy, continue and create patterns with objects and drawings				

Measurement and Geometry		Term 1	Term 2	Term 3	Term 4
Using units of measurement	Use direct and indirect comparisons to decide which is longer, heavier or holds more, and explain reasoning in everyday language				
	Compare and order the duration of events using the everyday language of time				
	Connect days of the week to familiar events and actions				
Shape	Sort, describe and name familiar two-dimensional shapes and three-dimensional objects in the environment				
Location and transformation	Describe position and movement				

Statistics and Probability		Term 1	Term 2	Term 3	Term 4
Data representation and interpretation	Answer yes/no questions to collect information				

Moorabbin Primary School

MATHEMATICS   LEVEL OVERVIEW   Level 1

Number and Algebra

		Term 1	Term 2	Term 3	Term 4
Number and place value	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				
	Recognise, model, read, write and order numbers to at least 100. Locate these numbers on a number line.				
	Count collections to 100 by partitioning numbers using place value				
	Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts				
Fractions and decimals	Recognise and describe one-half as one of two equal parts of a whole				
Money and financial mathematics	Recognise, describe and order Australian coins according to their value				
Patterns and algebra	Investigate and describe number patterns formed by skip counting and patterns with objects				

Measurement and Geometry

		Term 1	Term 2	Term 3	Term 4
Using units of measurement	Measure and compare the lengths and capacities of pairs of objects using uniform informal units				
	Tell time to the half-hour				
	Describe duration using months, weeks, days and hours				
Shape	Recognise and classify familiar two-dimensional shapes and three-dimensional objects using obvious features				
Location and transformation	Give and follow directions to familiar locations				

Statistics and Probability

		Term 1	Term 2	Term 3	Term 4
Chance	Identify outcomes of familiar events involving chance and describe them using everyday language such as 'will happen', 'won't happen' or 'might happen'				
Data representation and interpretation	Choose simple questions and gather responses				
	Represent data with objects and drawings where one object or drawing represents one data value. Describe the displays				

MATHEMATICS   LEVEL OVERVIEW   Level 2

Number and Algebra		Term 1	Term 2	Term 3	Term 4
Number and place value	Investigate number sequences, initially those increasing and decreasing by twos, threes, fives and ten from any starting point, then moving to other sequences				
	Recognise, model, represent and order numbers to at least 1000				
	Group, partition and rearrange collections up to 1000 in hundreds, tens and ones to facilitate more efficient counting				
	Explore the connection between addition and subtraction				
	Solve simple addition and subtraction problems using a range of efficient mental and written strategies				
	Recognise and represent multiplication as repeated addition, groups and arrays				
	Recognise and represent division as grouping into equal sets and solve simple problems using these representations				
Fractions and decimals	Recognise and interpret common uses of halves, quarters and eighths of shapes and collections				
Money and financial mathematics	Count and order small collections of Australian coins and notes according to their value				
Patterns and algebra	Describe patterns with numbers and identify missing elements				
	Solve problems by using number sentences for addition or subtraction				

Measurement and Geometry		Term 1	Term 2	Term 3	Term 4
Using units of measurement	Compare and order several shapes and objects based on length, area, volume and capacity using appropriate uniform informal units				
	Compare masses of objects using balance scales				
	Tell time to the quarter-hour, using the language of 'past' and 'to'				
	Name and order months and seasons				
	Use a calendar to identify the date and determine the number of days in each month				
Shape	Describe and draw two-dimensional shapes, with and without digital technologies				
	Describe the features of three-dimensional objects				
Location and transformation	Interpret simple maps of familiar locations and identify the relative positions of key features				
	Investigate the effect of one-step slides and flips with and without digital technologies				
	Identify and describe half and quarter turns				

Statistics and Probability		Term 1	Term 2	Term 3	Term 4
Chance	Identify practical activities and everyday events that involve chance. Describe outcomes as 'likely' or 'unlikely' and identify some events as 'certain' or 'impossible'				
Data representation and interpretation	Identify a question of interest based on one categorical variable. Gather data relevant to the question				
	Collect, check and classify data				
	Create displays of data using lists, table and picture graphs and interpret them				

Number and Algebra		Term 1	Term 2	Term 3	Term 4
Number and place value	Investigate the conditions required for a number to be odd or even and identify odd and even numbers				
	Recognise, model, represent and order numbers to at least 10 000				
	Apply place value to partition, rearrange and regroup numbers to at least 10 000 to assist calculations and solve problems				
	Recognise and explain the connection between addition and subtraction				
	Recall addition facts for single-digit numbers and related subtraction facts to develop increasingly efficient mental strategies for computation				
	Recall multiplication facts of two, three, five and ten and related division facts				
	Represent and solve problems involving multiplication using efficient mental and written strategies and appropriate digital technologies				
Fractions and decimals	Model and represent unit fractions including 1/2, 1/4, 1/3, 1/5 and their multiples to a complete whole				
Money and financial mathematics	Represent money values in multiple ways and count the change required for simple transactions to the nearest five cents				
Patterns and algebra	Describe, continue, and create number patterns resulting from performing addition or subtraction				

Measurement and Geometry		Term 1	Term 2	Term 3	Term 4
Using units of measurement	Measure, order and compare objects using familiar metric units of length, mass and capacity				
	Tell time to the minute and investigate the relationship between units of time				
Shape	Make models of three-dimensional objects and describe key features				
Location and transformation	Create and interpret simple grid maps to show position and pathways				
	Identify symmetry in the environment				
Geometric reasoning	Identify angles as measures of turn and compare angle sizes in everyday situations				

Statistics and Probability		Term 1	Term 2	Term 3	Term 4
Chance	Conduct chance experiments, identify and describe possible outcomes and recognise variation in results				
Data representation and interpretation	Identify questions or issues for categorical variables. Identify data sources and plan methods of data collection and recording				
	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				
	Interpret and compare data displays				

Number and Algebra		Term 1	Term 2	Term 3	Term 4
Number and place value	Investigate and use the properties of odd and even numbers				
	Recognise, represent and order numbers to at least tens of thousands				
	Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problems				
	Investigate number sequences involving multiples of 3, 4, 6, 7, 8, and 9				
	Recall multiplication facts up to 10 × 10 and related division facts				
	Develop efficient mental and written strategies and use appropriate digital technologies for multiplication and for division where there is no remainder				
Fractions and decimals	Investigate equivalent fractions used in contexts				
	Count by quarters halves and thirds, including with mixed numerals. Locate and represent these fractions on a number line				
	Recognise that the place value system can be extended to tenths and hundredths. Make connections between fractions and decimal notation				
Money and financial mathematics	Solve problems involving purchases and the calculation of change to the nearest five cents with and without digital technologies				
Patterns and algebra	Explore and describe number patterns resulting from performing multiplication				
	Solve word problems by using number sentences involving multiplication or division where there is no remainder				
	Use equivalent number sentences involving addition and subtraction to find unknown quantities				

Measurement and Geometry		Term 1	Term 2	Term 3	Term 4
Using units of measurement	Use scaled instruments to measure and compare lengths, masses, capacities and temperatures				
	Compare objects using familiar metric units of area and volume				
	Convert between units of time				
	Use am and pm notation and solve simple time problems				
Shape	Compare the areas of regular and irregular shapes by informal means				
	Compare and describe two dimensional shapes that result from combining and splitting common shapes, with and without the use of digital technologies				
Location and transformation	Use simple scales, legends and directions to interpret information contained in basic maps				
	Create symmetrical patterns, pictures and shapes with and without digital technologies				
Geometric reasoning	Compare angles and classify them as equal to, greater than or less than a right angle				

Statistics and Probability		Term 1	Term 2	Term 3	Term 4
Chance	Describe possible everyday events and order their chances of occurring				
	Identify everyday events where one cannot happen if the other happens				
	Identify events where the chance of one will not be affected by the occurrence of the other				
Data representation and interpretation	Select and trial methods for data collection, including survey questions and recording sheets				
	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				
	Evaluate the effectiveness of different displays in illustrating data features including variability				

Number and Algebra		Term 1	Term 2	Term 3	Term 4
Number and place value	Identify and describe factors and multiples of whole numbers and use them to solve problems				
	Use estimation and rounding to check the reasonableness of answers to calculations				
	Solve problems involving multiplication of large numbers by one- or two-digit numbers using efficient mental, written strategies and appropriate digital technologies				
	Solve problems involving division by a one digit number, including those that result in a remainder				
	Use efficient mental and written strategies and apply appropriate digital technologies to solve problems				
Fractions and decimals	Compare and order common unit fractions and locate and represent them on a number line				
	Investigate strategies to solve problems involving addition and subtraction of fractions with the same denominator				
	Recognise that the place value system can be extended beyond hundredths				
	Compare, order and represent decimals				
Money and financial mathematics	Create simple financial plans				
Patterns and algebra	Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction				
	Use equivalent number sentences involving multiplication and division to find unknown quantities				
Measurement and Geometry		Term 1	Term 2	Term 3	Term 4
Using units of measurement	Choose appropriate units of measurement for length, area, volume, capacity and mass				
	Calculate the perimeter and area of rectangles using familiar metric units				
	Compare 12- and 24-hour time systems and convert between them				
Shape	Connect three-dimensional objects with their nets and other two-dimensional representations				
Location and transformation	Use a grid reference system to describe locations. Describe routes using landmarks and directional language				
	Describe translations, reflections and rotations of two-dimensional shapes. Identify line and rotational symmetries				
	Apply the enlargement transformation to familiar two dimensional shapes and explore the properties of the resulting image compared with the original				
Geometric reasoning	Estimate, measure and compare angles using degrees. Construct angles using a protractor				
Statistics and Probability		Term 1	Term 2	Term 3	Term 4
Chance	List outcomes of chance experiments involving equally likely outcomes and represent probabilities of those outcomes using fractions				
	Recognise that probabilities range from 0 to 1				
Data representation and interpretation	Pose questions and collect categorical or numerical data by observation or survey				
	Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies				
	Describe and interpret different data sets in context				

Number and Algebra

		Term 1	Term 2	Term 3	Term 4
Number and place value	Identify and describe properties of prime, composite, square and triangular numbers				
	Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers				
	Investigate everyday situations that use integers. Locate and represent these numbers on a number line				
Fractions and decimals	Compare fractions with related denominators and locate and represent them on a number line				
	Solve problems involving addition and subtraction of fractions with the same or related denominators				
	Find a simple fraction of a quantity where the result is a whole number, with and without digital technologies				
	Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers				
	Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without digital technologies				
	Multiply and divide decimals by powers of 10				
	Make connections between equivalent fractions, decimals and percentages				
Money and financial mathematics	Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies				
Patterns and algebra	Continue and create sequences involving whole numbers, fractions and decimals. Describe the rule used to create the sequence				
	Explore the use of brackets and order of operations to write number sentences				

Measurement and Geometry

		Term 1	Term 2	Term 3	Term 4
Using units of measurement	Connect decimal representations to the metric system				
	Convert between common metric units of length, mass and capacity				
	Solve problems involving the comparison of lengths and areas using appropriate units				
	Connect volume and capacity and their units of measurement				
	Interpret and use timetables				
Shape	Construct simple prisms and pyramids				
Location and transformation	Investigate combinations of translations, reflections and rotations, with and without the use of digital technologies				
	Introduce the Cartesian coordinate system using all four quadrants				
Geometric reasoning	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				

Statistics and Probability

		Term 1	Term 2	Term 3	Term 4
Chance	Describe probabilities using fractions, decimals and percentages				
	Conduct chance experiments with both small and large numbers of trials using appropriate digital technologies				
	Compare observed frequencies across experiments with expected frequencies				
Data representation and interpretation	Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables				
	Interpret secondary data presented in digital media and elsewhere				

QUICK GUIDES

Number and Algebra

Foundation – Level 7

Each Quick Guide contains the content descriptions and elaborations for each level, with progression points and achievement standards broken down into smaller parts and aligned with the most relevant content descriptions.

Note that this breakdown of progression points and achievement standards and their alignment with content descriptions is the interpretation of Bellbridge Primary School, not necessarily intended by the VCAA or ACARA.

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 0.5 *A student progressing towards Foundation may, for example:*	Achievement Standard F.0
NUMBER AND PLACE VALUE (F-8)			
Establish understanding of the language and processes of counting by naming numbers in sequences, initially to and from 20, moving from any starting point	• reading stories from other cultures featuring counting in sequence to assist students to recognise ways of counting in local languages and across cultures • identifying the number words in sequence, backwards and forwards, and reasoning with the number sequences, establishing the language on which subsequent counting experiences can be built • developing fluency with forwards and backwards counting in meaningful contexts, including stories and rhymes • understanding that numbers are said in a particular order and there are patterns in the way we say them		
Connect number names, numerals and quantities, including zero, initially up to 10 and then beyond	• understanding that each object must be counted only once, that the arrangement of objects does not affect how many there are, and that the last number counted answers the 'how many' question • using scenarios to help students recognise that other cultures count in a variety of ways, such as by placing one pebble in a bag to represent one object (for example to count the number of cattle).	Match individual objects with counting sequences up to and back from 10. Connect number names and numerals with sets of up to 10 elements.	Match individual objects with counting sequences up to and back from 20. Connect number names and numerals with sets of up to 20 elements.
Subitise small collections of objects	• using subitising as the basis for ordering and comparing collections of numbers		Estimate the size of these sets (of up to 20).
Compare, order and make correspondences between collections, initially to 20, and explain reasoning	• comparing and ordering items of like and unlike characteristics using the words 'more', 'less', 'same as' and 'not the same as' and giving reasons for these answers • understanding and using terms such as 'first' and 'second' to indicate ordinal position in a sequence. • using objects which are personally and culturally relevant to students	Order the first, second and third elements of a set. Use counting strategies to solve problems that involve comparing, combining and separating these sets.	Order the first 10 elements of a set. Use counting strategies to solve problems that involve comparing, combining and separating these sets.
Represent practical situations to model addition and sharing	• using a range of practical strategies for adding small groups of numbers, such as visual displays or concrete materials • using Aboriginal and Torres Strait Islander methods of adding, including spatial patterns and reasoning		
PATTERNS AND ALGEBRA (F-10)			
Sort and classify familiar objects and explain the basis for these classifications. Copy, continue and create patterns with objects and drawings	• observing natural patterns in the world around us • creating and describing patterns using materials, sounds, movements or drawings		

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point F.5 *A student progressing towards Level 1 may, for example:*	Achievement Standard 1.0
NUMBER AND PLACE VALUE (F-8)			
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	• using the popular Korean counting game (sam-yuk-gu) for skip counting • developing fluency with forwards and backwards counting in meaningful contexts such as circle games	Connect number names and numerals with sets of more than 20 elements, and order the first 20 elements of a set. Subitise small collections of objects.	Describe number sequences resulting from skip counting by 2s, 5s and 10s.
Recognise, model, read, write and order numbers to at least 100. Locate these numbers on a number line.	• modelling numbers with a range of material and images • identifying numbers that are represented on a number line and placing numbers on a prepared number line		Count to and from 100 and locate these numbers on a number line.
Count collections to 100 by partitioning numbers using place value	• understanding partitioning of numbers and the importance of grouping in tens • understanding two-digit numbers as comprised of tens and ones/units		Partition numbers using place value.
Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts	• developing a range of mental strategies for addition and subtraction problems	Represent and solve simple addition and subtraction problems, using materials.	Carry out simple additions and subtractions, using counting strategies.
FRACTIONS AND DECIMALS (1-6)			
Recognise and describe one-half as one of two equal parts of a whole	• sharing a collection of readily available materials into two equal portions • splitting an object into two equal pieces and describing how the pieces are equal		Identify representations of one half.
MONEY AND FINANCIAL MATHEMATICS (1-10)			
Recognise, describe and order Australian coins according to their value	• showing that coins are different in other countries by comparing Asian coins to Australian coins • understanding that the value of Australian coins is not related to size • describing the features of coins that make it possible to identify them		Recognise Australian coins according to their value.
PATTERNS AND ALGEBRA (F-10)			
Investigate and describe number patterns formed by skip counting and patterns with objects	• using place-value patterns beyond the teens to generalise the number sequence and predict the next number • investigating patterns in the number system, such as the occurrence of a particular digit in the numbers to 100	Investigate simple patterns of objects and their images.	Continue simple patterns involving numbers and objects with and without the use of digital technology.

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 1.5 *A student progressing towards Level 2 may, for example:*	Achievement Standard 2.0
NUMBER AND PLACE VALUE (F-8)			
Investigate number sequences, initially those increasing and decreasing by twos, threes, fives and ten from any starting point, then moving to other sequences	• developing fluency and confidence with numbers and calculations by saying number sequences • recognising patterns in number sequences, such as adding 10 always results in the same final digit		Recognise increasing and decreasing number sequences involving 2s, 3s, 5s and 10s.
Recognise, model, represent and order numbers to at least 1000	• recognising there are different ways of representing numbers and identifying patterns going beyond 100 • developing fluency with writing numbers in meaningful contexts	Count to and from, and order numbers up to hundreds.	Count to and from, and order numbers up to 1000.
Group, partition and rearrange collections up to 1000 in hundreds, tens and ones to facilitate more efficient counting	• using an abacus to model and represent numbers • understanding three-digit numbers as comprised of hundreds, tens and ones/units • demonstrating and using models such as linking blocks, sticks in bundles, place-value blocks and Aboriginal bead strings and explaining reasoning	Recognise different ways of writing the same number. Group collections of objects in units, tens and hundreds.	
Explore the connection between addition and subtraction	• becoming fluent with partitioning numbers to understand the connection between addition and subtraction • using counting on to identify the missing element in an additive problem		
Solve simple addition and subtraction problems using a range of efficient mental and written strategies	• becoming fluent with a range of mental strategies for addition and subtraction problems, such as commutativity for addition, building to 10, doubles, 10 facts and adding 10 • modelling and representing simple additive situations using materials such as 10 frames, 20 frames and empty number lines		Perform simple addition and subtraction calculations, using a range of strategies.
Recognise and represent multiplication as repeated addition, groups and arrays	• representing array problems with available materials and explaining reasoning • visualising a group of objects as a unit and using this to calculate the number of objects in several identical groups		Use digital technology to produce sequences by constant addition.
Recognise and represent division as grouping into equal sets and solve simple problems using these representations	• dividing the class or a collection of objects into equal-sized groups • identifying the difference between dividing a set of objects into three equal groups and dividing the same set of objects into groups of three		Represent multiplication and division by grouping into sets.
FRACTIONS AND DECIMALS (1-6)			
Recognise and interpret common uses of halves, quarters and eighths of shapes and collections	• recognising that sets of objects can be partitioned in different ways to demonstrate fractions • relating the number of parts to the size of a fraction	Recognise and interpret common uses of halves and quarters.	Divide collections and shapes into halves, quarters and eighths
MONEY AND FINANCIAL MATHEMATICS (1-10)			
Count and order small collections of Australian coins and notes according to their value	• identifying equivalent values in collections of coins or notes, such as two five-cent coins having the same value as one 10-cent coin • counting collections of coins or notes to make up a particular value, such as that shown on a price tag		Find the total value of simple collections of Australian notes and coins.
PATTERNS AND ALGEBRA (F-10)			
Describe patterns with numbers and identify missing elements	• describing a pattern created by skip counting and representing the pattern on a number line • investigating features of number patterns resulting from adding twos, fives or 10s	Describe patterns with numbers and recognise simple digit patterns in number sequences.	Identify the missing element in a number sequence.
Solve problems by using number sentences for addition or subtraction	• representing a word problem as a number sentence • writing a word problem to represent a number sentence	Write and solve number sentences involving addition or subtraction.	

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 2.5 *A student progressing towards Level 3 may, for example:*	Achievement Standard 3.0
NUMBER AND PLACE VALUE (F-8)			
Investigate the conditions required for a number to be odd or even and identify odd and even numbers	• identifying even numbers using skip counting by twos or by grouping even collections of objects in twos • explaining why all numbers that end in the digits 0, 2, 4, 6 and 8 are even and that numbers ending in 1, 3, 5, 7 and 9 are odd	Count and order numbers to and from thousands.	Classify numbers as either odd or even.
Recognise, model, represent and order numbers to at least 10 000	• placing four-digit numbers on a number line using an appropriate scale • reproducing numbers in words using their numerical representations and vice versa		Count and order numbers to and from 10 000.
Apply place value to partition, rearrange and regroup numbers to at least 10 000 to assist calculations and solve problems	• recognising that 10 000 equals 10 thousands, 100 hundreds, 1000 tens and 10 000 ones • justifying choices about partitioning and regrouping numbers in terms of their usefulness for particular calculations	Apply place value to partition, rearrange and regroup numbers to help with calculations and solve problems.	
Recognise and explain the connection between addition and subtraction	• demonstrating the connection between addition and subtraction using partitioning or by writing equivalent number sentences		Recognise the connection between addition and subtraction.
Recall addition facts for single-digit numbers and related subtraction facts to develop increasingly efficient mental strategies for computation	• recognising that certain single-digit number combinations always result in the same answer for addition and subtraction, and using this knowledge for addition and subtraction of larger numbers • combining knowledge of addition and subtraction facts and partitioning to aid computation (for example 57 + 19 = 57 + 20 – 1)		Recall addition and multiplication facts for single-digit numbers.
Recall multiplication facts of two, three, five and ten and related division facts	• establishing multiplication facts using number sequences	Recall multiplication facts for 2, 5 and 10.	Explore simple number sequences based on multiples.
Represent and solve problems involving multiplication using efficient mental and written strategies and appropriate digital technologies	• writing simple word problems in numerical form and vice versa • using a calculator to check the solution and reasonableness of the answer		Solve problems using efficient strategies for multiplication with and without the use of digital technology.
FRACTIONS AND DECIMALS (1-6)			
Model and represent unit fractions including 1/2, 1/4, 1/3, 1/5 and their multiples to a complete whole	• partitioning areas, lengths and collections to create halves, thirds, quarters and fifths, such as folding the same sized sheets of paper to illustrate different unit fractions and comparing the number of parts with their sizes • locating unit fractions on a number line • recognising that in English the term 'one third' is used (order: numerator, denominator) but that in other languages this concept may be expressed as 'three parts, one of them' (order: denominator, numerator) for example Japanese	Model and represent the unit fractions of halves, thirds, quarters, fifths and eighths. Explore language differences associated with fractions.	Model and represent unit fractions for halves, thirds, quarters, fifths and eighths, and multiples of these up to one.
MONEY AND FINANCIAL MATHEMATICS (1-10)			
Represent money values in multiple ways and count the change required for simple transactions to the nearest five cents	• recognising the relationship between dollars and cents, and that not all countries use these denominations and divisions (for example Japanese Yen)		Represent money values in various ways and correctly count out change from financial transactions.
PATTERNS AND ALGEBRA (F-10)			
Describe, continue, and create number patterns resulting from performing addition or subtraction	• identifying and writing the rules for number patterns • describing a rule for a number pattern, then creating the pattern	Describe, continue and create number patterns formed by repeated addition or subtraction.	Continue number patterns involving addition or subtraction.

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 3.5 *A student progressing towards Level 4 may, for example:*	Achievement Standard 4.0
NUMBER AND PLACE VALUE (F-8)			
Investigate and use the properties of odd and even numbers	• using the four operations with pairs of odd or even numbers or one odd and one even number, then using the relationships established to check the accuracy of calculations		Use the properties of odd and even numbers.
Recognise, represent and order numbers to at least tens of thousands	• reproducing five-digit numbers in words using their numerical representations, and vice versa	Count and order numbers to and from tens of thousands.	
Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problems	• recognising and demonstrating that the place-value pattern is built on the operations of multiplication or division of tens		
Investigate number sequences involving multiples of 3, 4, 6, 7, 8, and 9	• recognising that number sequences can be extended indefinitely, and determining any patterns in the sequences	Investigate number sequences involving multiples of 3, 4, 6, 7, 8 and 9.	Continue number sequences involving multiples of single-digit numbers and unit fractions, and locate them on a number line.
Recall multiplication facts up to 10 × 10 and related division facts	• using known multiplication facts to calculate related division facts		Recall multiplication facts to 10 x 10 and related division facts.
Develop efficient mental and written strategies and use appropriate digital technologies for multiplication and for division where there is no remainder	• using known facts and strategies, such as commutativity, doubling and halving for multiplication, and connecting division to multiplication when there is no remainder	Use addition and subtraction facts to develop efficient mental strategies for computation.	Choose appropriate strategies for calculations involving multiplication and division, with and without the use of digital technology. Estimate answers accurately enough for the context.
FRACTIONS AND DECIMALS (1-6)			
Investigate equivalent fractions used in contexts	• exploring the relationship between families of fractions (halves, quarters and eighths or thirds and sixths) by folding a series of paper strips to construct a fraction wall		Recognise common equivalent fractions in familiar contexts.
Count by quarters halves and thirds, including with mixed numerals. Locate and represent these fractions on a number line	• converting mixed numbers to improper fractions and vice versa • investigating the use of fractions and sharing as a way of managing Country: for example taking no more than half the eggs from a nest to protect future bird populations	Count by quarters, halves and thirds, including with mixed numbers.	Locate familiar fractions on a number line.
Recognise that the place value system can be extended to tenths and hundredths. Make connections between fractions and decimal notation	• using division by 10 to extend the place-value system • using knowledge of fractions to establish equivalences between fractions and decimal notation	Make connections between fractions and decimal notation.	Make connections between fractions and decimal notations up to two decimal places.
MONEY AND FINANCIAL MATHEMATICS (1-10)			
Solve problems involving purchases and the calculation of change to the nearest five cents with and without digital technologies	• recognising that not all countries use dollars and cents, eg India uses rupees. • carrying out calculations in another currency as well as in dollars and cents, and identifying both as decimal systems	Calculate change and round to the nearest five cents.	Solve simple purchasing problems with and without the use of digital technology.
PATTERNS AND ALGEBRA (F-10)			
Explore and describe number patterns resulting from performing multiplication	• identifying examples of number patterns in everyday life		Describe number patterns resulting from multiplication.
Solve word problems by using number sentences involving multiplication or division where there is no remainder	• representing a word problem as a number sentence • writing a word problem using a given number sentence	Solve word problems by using number sentences involving multiplication or division.	
Use equivalent number sentences involving addition and subtraction to find unknown quantities	• writing number sentences to represent and answer questions such as: 'When a number is added to 23 the answer is the same as 57 minus 19. What is the number?' • using partitioning to find unknown quantities in number sentences	Use equivalent number sentences involving addition and subtraction to find unknown quantities.	Identify unknown quantities in number sentences.

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 4.5 *A student progressing towards Level 5 may, for example:*	Achievement Standard 5.0
NUMBER AND PLACE VALUE (F-8)			Identify and describe factors and multiples.
Identify and describe factors and multiples of whole numbers and use them to solve problems	• exploring factors and multiples using number sequences • using simple divisibility tests		
Use estimation and rounding to check the reasonableness of answers to calculations	• recognising the usefulness of estimation to check calculations • applying mental strategies to estimate the result of calculations, such as estimating the cost of a supermarket trolley load	Solve problems involving multiplication of large numbers by one- or two-digit numbers, using efficient mental and written methods and digital technology.	Estimate to check the reasonableness of answers and approximate answers by rounding.
Solve problems involving multiplication of large numbers by one- or two-digit numbers using efficient mental, written strategies and appropriate digital technologies	• exploring techniques for multiplication such as the area model, the Italian lattice method or the partitioning of numbers • applying the distributive law and using arrays to model multiplication and explain calculation strategies		Solve simple problems involving the four operations using a range of strategies including digital technology.
Solve problems involving division by a one digit number, including those that result in a remainder	• using the fact that equivalent division calculations result if both numbers are divided by the same factor • interpreting and representing the remainder in division calculations sensibly for the context	Use number properties for efficient mental calculation.	
Use efficient mental and written strategies and apply appropriate digital technologies to solve problems	• using calculators to check the reasonableness of answers		
FRACTIONS AND DECIMALS (1-6)			
Compare and order common unit fractions and locate and represent them on a number line	• recognising the connection between the order of unit fractions and their denominators		
Investigate strategies to solve problems involving addition and subtraction of fractions with the same denominator	• modelling and solving addition and subtraction problems involving fractions by using jumps on a number line, or making diagrams of fractions as parts of shapes		Add and subtract fractions with the same denominator.
Recognise that the place value system can be extended beyond hundredths	• using knowledge of place value and division by 10 to extend the number system to thousandths and beyond • recognising the equivalence of one thousandths and 0.001	Extend fluency with the number system to beyond tens of thousandths.	
Compare, order and represent decimals	• locating decimals on a number line	Represent and order decimals.	Order decimals and unit fractions and locate them on a number line.
MONEY AND FINANCIAL MATHEMATICS (1-10)			
Create simple financial plans	• creating a simple budget for a class fundraising event • identifying the GST component of invoices and receipts	Create a simple financial plan.	Explain plans for simple budgets.
PATTERNS AND ALGEBRA (F-10)			
Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction	• using the number line or diagrams to create patterns involving fractions or decimals		Continue patterns by adding or subtracting fractions and decimals.
Use equivalent number sentences involving multiplication and division to find unknown quantities	• using relevant problems to develop number sentences	Use equivalent number sentences involving multiplication and division to find unknown quantities.	Find unknown quantities in number sentences.

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 5.5 *A student progressing towards Level 6 may, for example:*	Achievement Standard 6.0
NUMBER AND PLACE VALUE (F-8)			
Identify and describe properties of prime, composite, square and triangular numbers	• understanding that some numbers have special properties and that these properties can be used to solve problems • representing composite numbers as a product of their prime factors and using this form to simplify calculations by cancelling common primes • understanding that if a number is divisible by a composite number then it is also divisible by the prime factors of that number (for example 216 is divisible by 8 because the number represented by the last three digits is divisible by 8, and hence 216 is also divisible by 2 and 4)	Represent composite numbers as a product of their prime factors. Identify the highest common factor (greatest common divisor) and lowest common multiple of two whole numbers.	Recognise the properties of prime, composite, square and triangular numbers and determine sets of these numbers.
Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers	• applying strategies already developed for solving problems involving small numbers to those involving large numbers • applying a range of strategies to solve realistic problems and commenting on the efficiency of different strategies		Solve problems that involve all four operations with whole numbers. Describe the use of integers in everyday contexts.
Investigate everyday situations that use integers. Locate and represent these numbers on a number line	• understanding that integers are ...-3, -2, -1, 0, 1, 2, 3,..... • solving everyday additive problems using a number line • investigating everyday situations that use integers, such as temperatures • using number lines to position and order integers around zero	Use ordered pairs of whole numbers to represent coordinates of points and locate these points on simple grids and in the first quadrant on the Cartesian plane.	Use ordered pairs of integers to represent coordinates of points, and locate a point in any one of the four quadrants on the Cartesian plane.
FRACTIONS AND DECIMALS (1-6)			
Compare fractions with related denominators and locate and represent them on a number line	• demonstrating equivalence between fractions using drawings and models		Locate fractions and integers on a number line.
Solve problems involving addition and subtraction of fractions with the same or related denominators	• understanding the processes for adding and subtracting fractions with related denominators and fractions as an operator, in preparation for calculating with all fractions • solving realistic additive (addition and subtraction) problems involving fractions to develop understanding of equivalent fractions and the use of fractions as operators • modelling and solving additive problems involving fractions by using methods such as jumps on a number line, or by making diagrams of fractions as parts of shapes		Solve problems involving the addition and subtraction of related fractions.
Find a simple fraction of a quantity where the result is a whole number, with and without digital technologies	• recognising that finding one third of a quantity is the same as dividing by 3		Calculate a simple fraction of a quantity.
Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers	• extending whole-number strategies to explore and develop meaningful written strategies for addition and subtraction of decimal numbers to thousandths • exploring and practising efficient methods for solving problems requiring operations on decimals, to gain fluency with calculating with decimals and with recognising appropriate operations		Add, subtract and multiply decimals, and divide decimals where the result is rational.
Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without digital technologies	• interpreting the results of calculations to provide an answer appropriate to the context		Make connections between the powers of 10 and the multiplication and division of decimals.
Multiply and divide decimals by powers of 10	• Multiplying and dividing decimals by multiples of powers of 10		
Make connections between equivalent fractions, decimals and percentages	• connecting fractions, decimals and percentages as different representations of the same number, moving fluently between representations and choosing the appropriate one for the problem being solved		Connect fractions, decimals and percentages as different representations of the same number.
MONEY AND FINANCIAL MATHEMATICS (1-10)			
Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies	• using authentic information to calculate prices on sale goods		Calculate common percentage discounts on sale items, with and without the use of digital technology.
PATTERNS AND ALGEBRA (F-10)			
Continue and create sequences involving whole numbers, fractions and decimals. Describe the rule used to create the sequence	• identifying and generalising number patterns • investigating additive and multiplicative patterns such as the number of tiles in a geometric pattern, or the number of dots or other shapes in successive repeats of a strip or border pattern looking for patterns in the way the numbers increase/decrease	Continue and create sequences involving whole numbers, fractions and decimals, according to a given rule.	Specify rules used to generate sequences involving whole numbers, fractions and decimals.
Explore the use of brackets and order of operations to write number sentences	• appreciating the need for rules to complete multiple operations within the same number sentence	Explore the use of brackets and order of operations to write and evaluate number sentences.	Write number sentences using brackets and order of operations.

Moorabbin Primary School

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 6.5 *A student progressing towards Level 7 may, for example:*	Achievement Standard 7.0
NUMBER AND PLACE VALUE (F-8)			
Investigate index notation and represent whole numbers as products of powers of prime numbers	• defining and comparing prime and composite numbers and explaining the difference between them • applying knowledge of factors to strategies for expressing whole numbers as products of powers of prime factors, such as repeated division by prime factors or creating factor trees • solving problems involving lowest common multiples and greatest common divisors (highest common factors) for pairs of whole numbers by comparing their prime factorisation	Investigate index notation and represent whole numbers as products of powers of prime numbers.	Make the connections between whole numbers and index notation and the relationship between perfect squares and square roots.
Investigate and use square roots of perfect square numbers	• investigating square numbers such as 25 and 36 and developing square-root notation • investigating between which two whole numbers a square root lies		
Apply the associative, commutative and distributive laws to aid mental and written computation	• understanding that arithmetic laws are powerful ways of describing and simplifying calculations		
Compare, order, add and subtract integers	*Nil*		Solve problems involving the order, addition and subtraction of integers.
REAL NUMBERS (7-10)			
Compare fractions using equivalence. Locate and represent positive and negative fractions and mixed numbers on a number line	• exploring equivalence among families of fractions by using a fraction wall or a number line (for example by using a fraction wall to show that 2/3 is the same as 4/6 and 6/9)	Find equivalent fractions and use them to order fractions. Locate fractions and mixed numbers on a number line.	Express fractions in their simplest form.
Solve problems involving addition and subtraction of fractions, including those with unrelated denominators	• exploring and developing efficient strategies to solve additive problems involving fractions (for example by using fraction walls or rectangular arrays with dimensions equal to the denominators)	Solve problems involving addition and subtraction of fractions, including those with unrelated denominators.	Solve problems involving all four operations with fractions, decimals, percentages and their equivalences.
Multiply and divide fractions and decimals using efficient written strategies and digital technologies	• investigating multiplication of fractions and decimals, using strategies including patterning and multiplication as repeated addition, with both concrete materials and digital technologies, and identifying the processes for division as the inverse of multiplication		
Express one quantity as a fraction of another, with and without the use of digital technologies	• using authentic examples for the quantities to be expressed and understanding the reasons for the calculations		
Round decimals to a specified number of decimal places	• using rounding to estimate the results of calculations with whole numbers and decimals, and understanding the conventions for rounding		Make simple estimates to judge the reasonableness of results.
Connect fractions, decimals and percentages and carry out simple conversions	• justifying choices of written, mental or calculator strategies for solving specific problems including those involving large numbers • understanding that quantities can be represented by different number types and calculated using various operations, and that choices need to be made about each • calculating the percentage of the total local municipal area set aside for parkland, manufacturing, retail and residential dwellings to compare land use		
Find percentages of quantities and express one quantity as a percentage of another, with and without digital technologies	• using authentic problems to express quantities as percentages of other amounts		
Recognise and solve problems involving simple ratios	• understanding that rate and ratio problems can be solved using fractions or percentages and choosing the most efficient form to solve a particular problem		
MONEY AND FINANCIAL MATHEMATICS (1-10)			
Investigate and calculate 'best buys', with and without digital technologies	• applying the unitary method to identify 'best buys' situations, such as comparing the cost per 100g	Investigate and calculate 'best buys' and solve problems involving simple ratios, with and without the use of digital technology.	Compare the cost of items to make financial decisions, with and without the use of digital technology.

Continued…

Moorabbin Primary School

Number and Algebra Level 7 Continued…

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 6.5 *A student progressing towards Level 7 may, for example:*	Achievement Standard 7.0
PATTERNS AND ALGEBRA (F-10)			
Introduce the concept of variables as a way of representing numbers using letters	• understanding that arithmetic laws are powerful ways of describing and simplifying calculations and that using these laws leads to the generality of algebra	Use substitution to check solutions.	Use variables to represent arbitrary numbers.
Create algebraic expressions and evaluate them by substituting a given value for each variable	• using authentic formulas to perform substitutions		Substitute numbers into algebraic expressions.
Extend and apply the laws and properties of arithmetic to algebraic terms and expressions	• identifying order of operations in contextualised problems, preserving the order by inserting brackets in numerical expressions, then recognising how order is preserved by convention • moving fluently between algebraic and word representations as descriptions of the same situation		Connect the laws and properties of number to algebra.
LINEAR AND NON-LINEAR RELATIONSHIPS (7-10)			
Given coordinates, plot points on the Cartesian plane, and find coordinates for a given point	• plotting points from a table of integer values and recognising simple patterns, such as points that lie on a straight line	Use a variety of methods to solve linear equations with whole number solutions.	Assign ordered pairs to given points on the Cartesian plane.
Solve simple linear equations	• solving equations using concrete materials, such as the balance model, and explain the need to do the same thing to each side of the equation using substitution to check solutions • investigating a range of strategies to solve equations		Develop simple linear models for situations, make predictions based on these models, solve related equations and check their solutions.
Investigate, interpret and analyse graphs from authentic data	• using travel graphs to investigate and compare the distance travelled to and from school • interpreting features of travel graphs such as the slope of lines and the meaning of horizontal lines • using graphs of evaporation rates to explore water storage		Interpret and analyse graphs of relations from real data.

QUICK GUIDES

Measurement and Geometry

Foundation – Level 7

Each Quick Guide contains the content descriptions and elaborations for each level, with progression points and achievement standards broken down into smaller parts and aligned with the most relevant content descriptions.

Note that this breakdown of progression points and achievement standards and their alignment with content descriptions is the interpretation of Bellbridge Primary School, not necessarily intended by the VCAA or ACARA.

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 0.5 *A student progressing towards Foundation may, for example:*	Achievement Standard F.0
USING UNITS OF MEASUREMENT (F-10)			
Use direct and indirect comparisons to decide which is longer, heavier or holds more, and explain reasoning in everyday language	• comparing objects directly, by placing one object against another to determine which is longer or by pouring from one container into the other to see which one holds more • using suitable language associated with measurement attributes, such as 'tall' and 'taller', 'heavy' and 'heavier', 'holds more' and 'holds less'	Compare lengths and masses of familiar objects. Identify measurement attributes of length and mass in practical situations.	Compare lengths, masses and capacities of familiar objects. Identify measurement attributes in practical situations.
Compare and order the duration of events using the everyday language of time	• knowing and identifying the days of the week and linking specific days to familiar events • sequencing familiar events in time order	Order events in a day.	Order events and explain their duration.
Connect days of the week to familiar events and actions	• choosing events and actions that make connections with students' everyday family routines	Name the days of the week, in order.	Match days of the week to familiar events.
SHAPE (F-7)			
Sort, describe and name familiar two-dimensional shapes and three-dimensional objects in the environment	• sorting and describing squares, circles, triangles, rectangles, spheres and cubes	Identify simple shapes in their environment.	Identify simple shapes in their environment. Sort shapes by their common and distinctive features.
LOCATION AND TRANSFORMATION (F-7)			
Describe position and movement	• interpreting the everyday language of location and direction, such as 'between', 'near', 'next to', 'forwards', 'towards' • following and giving simple directions to guide a friend around an obstacle path and vice versa	Use simple location words.	Use simple statements and gestures to describe location.

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point F.5 *A student progressing towards Level 1 may, for example:*	Achievement Standard 1.0
USING UNITS OF MEASUREMENT (F-10)		Use direct and indirect comparisons to decide which of two objects is longer, heavier or holds more, and explain reasoning.	Use informal units of measurement to order objects based on length and capacity.
Measure and compare the lengths and capacities of pairs of objects using uniform informal units	• understanding that in order to compare objects, the unit of measurement must be the same size		
Tell time to the half-hour	• reading time on analogue and digital clocks and observing the characteristics of half-hour times		Tell time to the half-hour.
Describe duration using months, weeks, days and hours	• describing the duration of familiar situations such as 'how long is it until we next come to school?'	Place familiar events in time order.	Explain time durations.
SHAPE (F-7)		Identify, sort and name familiar three-dimensional objects in their environment.	Describe two-dimensional shapes and three-dimensional objects.
Recognise and classify familiar two-dimensional shapes and three-dimensional objects using obvious features	• focusing on geometric features and describing shapes and objects using everyday words such as 'corners', 'edges' and 'faces'		
LOCATION AND TRANSFORMATION (F-7)		Describe movement, and follow and give simple directions.	Use the language of distance and direction to move from place to place.
Give and follow directions to familiar locations	• understanding that people need to give and follow directions to and from a place, and that this involves turns, direction and distance • understanding the meaning and importance of words such as 'clockwise', 'anticlockwise', 'forward' and 'under' when giving and following directions • interpreting and following directions around familiar locations		

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 1.5 *A student progressing towards Level 2 may, for example:*	Achievement Standard 2.0
USING UNITS OF MEASUREMENT (F-10)			
Compare and order several shapes and objects based on length, area, volume and capacity using appropriate uniform informal units	• comparing lengths using finger length, hand span or a piece of string • comparing areas using the palm of the hand or a stone • comparing capacities using a range of containers	Compare and order familiar objects by their length and relative mass.	Order shapes and objects, using informal units for a range of measures.
Compare masses of objects using balance scales	• using balance scales to determine whether the mass of different objects is more, less or about the same, or to find out how many marbles are needed to balance a tub of margarine or a carton of milk		
Tell time to the quarter-hour, using the language of 'past' and 'to'	• describing the characteristics of quarter-past times on an analogue clock, and identifying that the small hand is pointing just past the number and the big hand is pointing to the three		Tell time to the quarter hour.
Name and order months and seasons	• investigating the seasons used by Aboriginal people, comparing them to those used in Western society and recognising the connection to weather patterns.		Use a calendar to identify the date, days, weeks and months included in seasons and other events.
Use a calendar to identify the date and determine the number of days in each month	• using calendars to locate specific information, such as finding a given date on a calendar and saying what day it is, and identifying personally or culturally specific days	Describe the duration of familiar events in terms of hours, days and weeks.	
SHAPE (F-7)			
Describe and draw two-dimensional shapes, with and without digital technologies	• identifying key features of squares, rectangles, triangles, kites, rhombuses and circles, such as straight lines or curved lines, and counting the edges and corners	Recognise and classify familiar shapes and objects, using their features.	Draw two-dimensional shapes, and specify their features.
Describe the features of three-dimensional objects	• identifying geometric features such as the number of faces, corners or edges		Recognise the features of three-dimensional objects.
LOCATION AND TRANSFORMATION (F-7)			
Interpret simple maps of familiar locations and identify the relative positions of key features	• understanding that we use representations of objects and their positions, such as on maps, to allow us to receive and give directions and to describe place • constructing arrangements of objects from a set of directions	Give and follow directions to and from a place using everyday language for orientation, relative position, direction and distance.	Interpret simple maps of familiar locations.
Investigate the effect of one-step slides and flips with and without digital technologies	• understanding that objects can be moved but changing position does not alter an object's size or features		Explain the effects of one-step transformations.
Identify and describe half and quarter turns	• predicting and reproducing a pattern based around half and quarter turns of a shape and sketching the next element in the pattern		

MATHEMATICS   STRAND: Measurement and Geometry   Level 3

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 2.5 *A student progressing towards Level 3 may, for example:*	Achievement Standard 3.0
USING UNITS OF MEASUREMENT (F-10)			
Measure, order and compare objects using familiar metric units of length, mass and capacity	• recognising the importance of using common units of measurement • recognising and using centimetres and metres, grams and kilograms, and millilitres and litres	Compare the masses of objects, using balance scales.	Use metric units for length, mass and capacity.
Tell time to the minute and investigate the relationship between units of time	• recognising there are 60 minutes in an hour and 60 seconds in a minute	Interpret digital and analogue representations of minutes, hours, days, weeks and years.	Tell time to the nearest minute.
SHAPE (F-7)			
Make models of three-dimensional objects and describe key features	• exploring the creation of three-dimensional objects using origami, including prisms and pyramids	Explore the properties of prisms.	Make models of three-dimensional objects.
LOCATION AND TRANSFORMATION (F-7)			
Create and interpret simple grid maps to show position and pathways	• creating a map of the classroom or playground	Interpret grid maps of their local environment.	Create simple maps. Match positions on maps with given information.
Identify symmetry in the environment	• identifying symmetry in Aboriginal rock carvings or art • identifying symmetry in the natural and built environment		Identify symmetry in natural and constructed environments.
GEOMETRIC REASONING (3-10)			
Identify angles as measures of turn and compare angle sizes in everyday situations	• opening doors partially and fully and comparing the size of the angles created • recognising that analogue clocks use the turning of arms to indicate time, and comparing the size of angles between the arms for familiar times	Recognise angles in terms of turns in everyday situations.	Use angle size as a measure of turn in real situations.

Moorabbin Primary School

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 3.5 *A student progressing towards Level 4 may, for example:*	Achievement Standard 4.0
USING UNITS OF MEASUREMENT (F-10)		Use scaled instruments to measure length, angle, area and mass.	Use scaled instruments to measure length, angle, area, mass, capacity and temperature of shapes and objects.
Use scaled instruments to measure and compare lengths, masses, capacities and temperatures	• reading and interpreting the graduated scales on a range of measuring instruments to the nearest graduation		
Compare objects using familiar metric units of area and volume	• comparing areas using grid paper • comparing volume using centicubes • recognising that metric units are not the only units used throughout the world, for example measuring the area of floor space using tatami mats (Japan), using squares for room and house area (Australia)		
Convert between units of time	• identifying and using the correct operation for converting units of time		Convert between units of time.
Use am and pm notation and solve simple time problems	• calculating the time spent at school during a normal school day • calculating the time required to travel between two locations • determining arrival time given departure time	Use am and pm notation. Identify time between two events.	Solve problems involving time duration.
SHAPE (F-7)			
Compare the areas of regular and irregular shapes by informal means	• comparing areas using metric units, such as counting the number of square centimetres required to cover two areas by overlaying the areas with a grid of centimetre squares		Compare areas of regular and irregular shapes, using informal units.
Compare and describe two dimensional shapes that result from combining and splitting common shapes, with and without the use of digital technologies	• identifying common two-dimensional shapes that are part of a composite shape by re-creating it from these shapes • creating a two-dimensional shapes from verbal or written instructions		
LOCATION AND TRANSFORMATION (F-7)			
Use simple scales, legends and directions to interpret information contained in basic maps	• identifying the scale used on maps of cities and rural areas in Australia and a city in Indonesia and describing the difference • using directions to find features on a map		Interpret information contained in maps.
Create symmetrical patterns, pictures and shapes with and without digital technologies	• using stimulus materials such as the motifs in Central Asian textiles, Tibetan artefacts, Indian lotus designs and symmetry in Yolngu or Central and Western Desert art	Identify and describe symmetry, asymmetry and pattern in natural and made objects.	Create symmetrical simple and composite shapes and patterns, with and without the use of digital technology.
GEOMETRIC REASONING (3-10)			
Compare angles and classify them as equal to, greater than or less than a right angle	• creating angles and comparing them to a right angle using digital technologies		Classify angles in relation to a right angle.

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 4.5 *A student progressing towards Level 5 may, for example:*	Achievement Standard 5.0
USING UNITS OF MEASUREMENT (F-10)			
Choose appropriate units of measurement for length, area, volume, capacity and mass	• investigating alternative measures of scale to demonstrate that these vary between countries and change over time, for example temperature measurement in Australia, Indonesia, Japan and USA • recognising that some units of measurement are better suited for some tasks than others, for example kilometres rather than metres to measure the distance between two towns	Investigate units of measurement from historical and cultural contexts. Convert between units of metric and other standard non-metric systems of measurement.	Use appropriate units of measurement for length, area, volume, capacity and mass.
Calculate the perimeter and area of rectangles using familiar metric units	• exploring efficient ways of calculating the perimeters of rectangles such as adding the length and width together and doubling the result • exploring efficient ways of finding the areas of rectangles	Use square centimetres, square metres, square kilometres and hectares as units of area. Estimate areas by counting squares.	Calculate perimeter and area of rectangles.
Compare 12- and 24-hour time systems and convert between them	• investigating the ways time was and is measured in different Aboriginal Country, such as using tidal change • using units hours, minutes and seconds		Convert between 12 and 24-hour time.
SHAPE (F-7)			
Connect three-dimensional objects with their nets and other two-dimensional representations	• identifying the shape and relative position of each face of a solid to determine the net of the solid, including that of prisms and pyramids • representing two-dimensional shapes such as photographs, sketches and images created by digital technologies		Connect three-dimensional objects with their two-dimensional representations.
LOCATION AND TRANSFORMATION (F-7)			
Use a grid reference system to describe locations. Describe routes using landmarks and directional language	• comparing aerial views of Country, desert paintings and maps with grid references • creating a grid reference system for the classroom and using it to locate objects and describe routes from one object to another	Describe routes using landmarks. Compare maps with aerial photographs or representations created by digital technology.	Use a grid reference system to locate landmarks.
Describe translations, reflections and rotations of two-dimensional shapes. Identify line and rotational symmetries	• identifying and describing the line and rotational symmetry of a range of two-dimensional shapes, by manually cutting, folding and turning shapes and by using digital technologies • identifying the effects of transformations by manually flipping, sliding and turning two-dimensional shapes and by using digital technologies		Describe transformations of two-dimensional shapes. Identify line and rotational symmetry.
Apply the enlargement transformation to familiar two dimensional shapes and explore the properties of the resulting image compared with the original	• using digital technologies to enlarge shapes • using a grid system to enlarge a favourite image or cartoon		
GEOMETRIC REASONING (3-10)			
Estimate, measure and compare angles using degrees. Construct angles using a protractor	• measuring and constructing angles using both 180° and 360° protractors • recognising that angles have arms and a vertex, and that size is the amount of turn required for one arm to coincide with the other	Estimate angles between 0 and 360 degrees in both clockwise and anticlockwise directions.	Estimate angles, and use protractors and digital technology to construct and measure angles.

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 5.5 *A student progressing towards Level 6 may, for example:*	Achievement Standard 6.0
USING UNITS OF MEASUREMENT (F-10)			Relate decimals to the metric system.
Connect decimal representations to the metric system	• recognising the equivalence of measurements such as 1.25 metres and 125 centimetres		Relate decimals to the metric system.
Convert between common metric units of length, mass and capacity	• identifying and using the correct operations when converting units including millimetres, centimetres, metres, kilometres, milligrams, grams, kilograms, tonnes, millilitres, litres, kilolitres and megalitres • recognising the significance of the prefixes in units of measurement	Convert between common metric units. Recognise metric prefixes.	Choose appropriate units of measurement to perform a calculation.
Solve problems involving the comparison of lengths and areas using appropriate units	• recognising and investigating familiar objects using concrete materials and digital technologies		Solve problems involving length and area.
Connect volume and capacity and their units of measurement	• recognising that 1ml is equivalent to 1cm^3		Make connections between capacity and volume.
Interpret and use timetables	• planning a trip involving one or more modes of public transport • developing a timetable of daily activities	Access print and digital timetables, answer simple questions using a timetable and create simple personal timetables.	Interpret a variety of everyday timetables.
SHAPE (F-7)			
Construct simple prisms and pyramids	• considering the history and significance of pyramids from a range of cultural perspectives including those structures found in China, Korea and Indonesia • constructing prisms and pyramids from nets, and skeletal models		Construct simple prisms and pyramids.
LOCATION AND TRANSFORMATION (F-7)			
Investigate combinations of translations, reflections and rotations, with and without the use of digital technologies	• designing a school or brand logo using transformation of one or more shapes • understanding that translations, rotations and reflections can change the position and orientation but not shape or size		Investigate simple combinations of transformations in the plane, with and without the use of digital technology.
Introduce the Cartesian coordinate system using all four quadrants	• understanding that the Cartesian plane provides a graphical or visual way of describing location		
GEOMETRIC REASONING (3-10)			
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	• identifying the size of a right angle as 90° and defining acute, obtuse, straight and reflex angles • measuring, estimating and comparing angles in degrees and classifying angles according to their sizes • investigating the use of rotation and symmetry in the diagrammatic representations of kinship relationships of Central and Western Desert people • recognising and using the two alternate conventions for naming angles	Describe acute, obtuse and reflex angles in terms of their relationship to multiples of a right angle. Investigate compass points, angles on a straight line, angles at a point, and vertically opposite angles.	Solve problems using the properties of angles.

Moorabbin Primary School

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 6.5 *A student progressing towards Level 7 may, for example:*	Achievement Standard 7.0
USING UNITS OF MEASUREMENT (F-10)			
Establish the formulas for areas of rectangles, triangles and parallelograms and use these in problem solving	• building on the understanding of the area of rectangles to develop formulas for the area of triangles • establishing that the area of a triangle is half the area of an appropriate rectangle • using area formulas for rectangles and triangles to solve problems involving areas of surfaces	Use formulas for the area and perimeter of a square.	Use formulas for the area and perimeter of rectangles.
Calculate volumes of rectangular prisms	• investigating volumes of cubes and rectangular prisms and establishing and using the formula $V = l \times b \times h$ • understanding and using cubic units when interpreting and finding volumes of cubes and rectangular prisms	Calculate the surface area and volume of a cube.	Calculate volumes of rectangular prisms.
SHAPE (F-7)			
Draw different views of prisms and solids formed from combinations of prisms	• using aerial views of buildings and other 3-D structures to visualise the structure of the building or prism	Draw different views of prisms, and solids formed from combinations of prisms.	Describe different views of three-dimensional objects, and use models, sketches and digital technology to represent these views.
LOCATION AND TRANSFORMATION (F-7)			
Describe translations, reflections in an axis, and rotations of multiples of 90° on the Cartesian plane using coordinates. Identify line and rotational symmetries	• describing patterns and investigating different ways to produce the same transformation such as using two successive reflections to provide the same result as a translation • experimenting with, creating and re-creating patterns using combinations of reflections and rotations using digital technologies		Represent transformations of triangles and quadrilaterals on the Cartesian plane, with and without the use of digital technology.
GEOMETRIC REASONING (3-10)			
Identify corresponding, alternate and co-interior angles when two straight lines are crossed by a transversal	• defining and classifying pairs of angles as complementary, supplementary, adjacent and vertically opposite		Name the types of angles formed by a transversal crossing parallel line, and solve simple numerical problems involving these lines and angles.
Investigate conditions for two lines to be parallel and solve simple numerical problems using reasoning	• constructing parallel and perpendicular lines using their properties, a pair of compasses and a ruler, and dynamic geometry software • defining and identifying the relationships between alternate, corresponding and co-interior angles for a pair of parallel lines cut by a transversal	Construct parallel and perpendicular lines.	
Demonstrate that the angle sum of a triangle is 180° and use this to find the angle sum of a quadrilateral	• using concrete materials and digital technologies to investigate the angle sum of a triangle and quadrilateral	Demonstrate that the angle sum in a triangle is 180 degrees.	
Classify triangles according to their side and angle properties and describe quadrilaterals	• identifying side and angle properties of scalene, isosceles, right-angled and obtuse-angled triangles • describing squares, rectangles, rhombuses, parallelograms, kites and trapeziums	Identify squares, rectangles, rhombuses, parallelograms, kites and trapeziums based on their properties.	Classify triangles and quadrilaterals.

QUICK GUIDES

Statistics and Probability

Foundation – Level 7

Each Quick Guide contains the content descriptions and elaborations for each level, with progression points and achievement standards broken down into smaller parts and aligned with the most relevant content descriptions.

Note that this breakdown of progression points and achievement standards and their alignment with content descriptions is the interpretation of Bellbridge Primary School, not necessarily intended by the VCAA or ACARA.

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 0.5 *A student progressing towards Foundation may, for example:*	Achievement Standard F.0
DATA REPRESENTATION AND INTERPRETATION (F-10)			
Answer yes/no questions to collect information	• posing questions about themselves and familiar objects and events • representing responses to questions using simple displays, including grouping students according to their answers • using data displays to answer simple questions such as 'how many students answered "yes" to having brown hair?'	Answer simple yes/no questions about given categorical data that are sorted.	Sort familiar categorical data into sets and use these to answer yes/no questions and make simple true/false statements about the data.

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point F.5 *A student progressing towards Level 1 may, for example:*	Achievement Standard 1.0
CHANCE (1-10)			
Identify outcomes of familiar events involving chance and describe them using everyday language such as 'will happen', 'won't happen' or 'might happen'	• justifying that some events are certain or impossible	Describe outcomes of simple familiar events using 'will happen', 'won't happen' or 'might happen'.	Classify outcomes of simple familiar events.
DATA REPRESENTATION AND INTERPRETATION (F-10)			
Choose simple questions and gather responses	• determining which questions will gather appropriate responses for a simple investigation	Sort objects into designated categories on diagrams and create their own visual records by sorting objects or their images.	Ask questions to collect and draw simple data displays.
Represent data with objects and drawings where one object or drawing represents one data value. Describe the displays	• understanding one-to-one correspondence • describing displays by identifying categories with the greatest or least number of objects		Describe data displays.

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 1.5 *A student progressing towards Level 2 may, for example:*	Achievement Standard 2.0
CHANCE (1-10)			
Identify practical activities and everyday events that involve chance. Describe outcomes as 'likely' or 'unlikely' and identify some events as 'certain' or 'impossible'	• classifying a list of everyday events according to how likely they are to happen, using the language of chance, and explaining reasoning	Explain why they think an event is 'certain' or 'impossible'.	Describe outcomes of familiar events using everyday language.
DATA REPRESENTATION AND INTERPRETATION (F-10)			
Identify a question of interest based on one categorical variable. Gather data relevant to the question	• determining the variety of birdlife in the playground and using a prepared table to record observations		Collect data from relevant questions to create lists, tables and picture graphs with and without the use of digital technology.
Collect, check and classify data	• recognising the usefulness of tally marks • identifying categories of data and using them to sort data	Use tallies and tables to record answers to questions and summarise the answers by counting.	
Create displays of data using lists, table and picture graphs and interpret them	• creating picture graphs to represent data using one-to-one correspondence • comparing the usefulness of different data displays		Interpret data in context.

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 2.5 *A student progressing towards Level 3 may, for example:*	Achievement Standard 3.0
CHANCE (1-10)		Place events from familiar contexts in order of how likely they are to happen.	Conduct chance experiments, list possible outcomes and recognise variations in results.
Conduct chance experiments, identify and describe possible outcomes and recognise variation in results	• conducting repeated trials of chance experiments such as tossing a coin or drawing a ball from a bag and identifying the variations between trials	Recognise variation in measurements and other data.	
DATA REPRESENTATION AND INTERPRETATION (F-10)			
Identify questions or issues for categorical variables. Identify data sources and plan methods of data collection and recording	• refining questions and planning investigations that involve collecting data, and carrying out the investigation (for example narrowing the focus of a question such as 'which is the most popular breakfast cereal?' to 'which is the most popular breakfast cereal among Level 3 students in our class?')		Carry out simple data investigations for categorical variables.
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	• exploring meaningful and increasingly efficient ways to record data, and representing and reporting the results of investigations • collecting data to investigate features in the natural environment	Make tallies and convert them into one-to-one picture graphs (pictographs) and bar charts.	
Interpret and compare data displays	• comparing various student-generated data representations and describing their similarities and differences		Interpret and compare data displays.

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 3.5 *A student progressing towards Level 4 may, for example:*	Achievement Standard 4.0
CHANCE (1-10)		Compare one event to the other as being less, equally or more likely to happen, and justify their reasoning.	List the probabilities of everyday events.
Describe possible everyday events and order their chances of occurring	• using lists of events familiar to students and ordering them from 'least likely' to 'most likely' to occur		
Identify everyday events where one cannot happen if the other happens	• using examples such as weather, which cannot be dry and wet at the same time	Identify everyday events where if one event occurs, the other event cannot occur.	Identify dependent and independent events.
Identify events where the chance of one will not be affected by the occurrence of the other	• explaining why the probability of a new baby being either a boy or a girl does not depend on the sex of the previous baby		
DATA REPRESENTATION AND INTERPRETATION (F-10)			
Select and trial methods for data collection, including survey questions and recording sheets	• comparing the effectiveness of different methods of collecting data • choosing the most effective way to collect data for a given investigation	Define data sources, and plan and trial methods of data collection and recording.	
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	• exploring ways of presenting data and showing the results of investigations • investigating data displays using many-to-one correspondence	Use a variety of methods of data presentation.	Construct data displays from given or collected data, with and without the use of digital technology.
Evaluate the effectiveness of different displays in illustrating data features including variability	• interpreting data representations in the media and other forums in which symbols represent more than one data value • suggesting questions that can be answered by a given data display and using the display to answer questions	Identify questions or issues involving categorical variables.	Describe different methods for data collection and representation, and evaluate their effectiveness.

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 4.5 *A student progressing towards Level 5 may, for example:*	Achievement Standard 5.0
CHANCE (1-10)		Recognise that probabilities range from 0 to 1, and place events in order on a number line from 0 to 1 based on their probability.	List outcomes of chance experiments with equally likely outcomes.
List outcomes of chance experiments involving equally likely outcomes and represent probabilities of those outcomes using fractions	• commenting on the likelihood of winning simple games of chance by considering the number of possible outcomes and the consequent chance of winning in simple games of chance such as jan-ken-pon (rock-paper-scissors)		
Recognise that probabilities range from 0 to 1	• investigating the probabilities of all outcomes for a simple chance experiment and verifying that their sum equals 1		Assign probabilities as a number from 0 to 1.
DATA REPRESENTATION AND INTERPRETATION (F-10)			
Pose questions and collect categorical or numerical data by observation or survey	• posing questions about insect diversity in the playground, collecting data by taping a one-metre-square piece of paper to the playground and observing the type and number of insects on it over time		Pose questions to gather data.
Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies	• identifying the best methods of presenting data to illustrate the results of investigations and justifying the choice of representations	Construct column graphs and picture graphs where one picture can represent many data values from given or collected data, with and without the use of digital technology.	Construct various displays appropriate for the data, with and without the use of digital technology.
Describe and interpret different data sets in context	• using and comparing data representations for different data sets to help decision making		Compare and interpret different data sets.

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 5.5 *A student progressing towards Level 6 may, for example:*	Achievement Standard 6.0
CHANCE (1-10)			
Describe probabilities using fractions, decimals and percentages	• investigating games of chance popular in different cultures and evaluating the relative benefits to the organisers and participants (for example Pachinko)	Represent probabilities as simple ratios and fractions.	Specify, list and communicate probabilities of events using simple ratios, fractions, decimals and percentages.
Conduct chance experiments with both small and large numbers of trials using appropriate digital technologies	• conducting repeated trials of chance experiments, identifying the variation between trials and realising that the results tend to the prediction with larger numbers of trials	Conduct chance experiments with both small and large numbers of trials, using digital technology.	
Compare observed frequencies across experiments with expected frequencies	• predicting likely outcomes from a run of chance events and distinguishing these from surprising results	Recognise that probability can be interpreted as an expected frequency.	Compare observed and expected frequencies of events, including those where outcomes of trials are generated with the use of digital technology.
DATA REPRESENTATION AND INTERPRETATION (F-10)			
Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables	• comparing different student-generated diagrams, tables and graphs, describing their similarities and differences and commenting on the usefulness of each representation for interpreting the data • understanding that data can be represented in different ways, sometimes with one symbol representing more than one piece of data, and that it is important to read all information about a representation before making judgments	Evaluate the effectiveness of different displays in illustrating data features, including variability. Pose questions and collect categorical or numerical data by observation or survey.	Interpret and compare a variety of data displays, including displays for two categorical variables.
Interpret secondary data presented in digital media and elsewhere	• investigating data representations in the media and discussing what they illustrate and the messages the people who created them might want to convey • identifying potentially misleading data representations in the media, such as graphs with broken axes or non-linear scales, graphics not drawn to scale, data not related to the population about which the claims are made, and pie charts in which the whole pie does not represent the entire population about which the claims are made	Distinguish between a sample and a population.	Analyse and evaluate data from secondary sources.

Content Descriptions *(what to teach/learn)*	Elaborations *(examples to illustrate the content)*	Progression Point 6.5 *A student progressing towards Level 7 may, for example:*	Achievement Standard 7.0
CHANCE (1-10)			
Construct sample spaces for single-step experiments with equally likely outcomes	• discussing the meaning of probability terminology (for example probability, sample space, favourable outcomes, trial, events and experiments) • distinguishing between equally likely outcomes and outcomes that are not equally likely		Determine the sample space for simple experiments with equally likely outcomes, and assign probabilities outcomes.
Assign probabilities to the outcomes of events and determine probabilities for events	• expressing probabilities as decimals, fractionals and percentages		
DATA REPRESENTATION AND INTERPRETATION (F-10)			
Identify and investigate issues involving numerical data collected from primary and secondary sources	• obtaining secondary data from newspapers, the Internet and the Australian Bureau of Statistics • investigating secondary data relating to the distribution and use of non-renewable resources around the world	Interpret secondary data presented in digital media and elsewhere, including consideration of sampling, misleading displays, bias and purpose.	Identify issues involving the collection of discrete and continuous data from primary and secondary sources.
Construct and compare a range of data displays including stem-and-leaf plots and dot plots	• understanding that some data representations are more appropriate than others for particular data sets, and answering questions about those data sets • using ordered stem-and-leaf plots to record and display numerical data collected in a class investigation, such as constructing a class plot of height in centimetres on a shared stem-and-leaf plot for which the stems 12, 13, 14, 15, 16 and 17 have been produced	Create side-by-side column graphs. Determine probabilities by symmetry and counting.	Construct stem-and-leaf plots and dot-plots.
Calculate mean, median, mode and range for sets of data. Interpret these statistics in the context of data	• understanding that summarising data by calculating measures of centre and spread can help make sense of the data	Recognise that summarising data by calculating measures of centre and spread can help make sense of the data.	Identify or calculate mean, mode, median and range for data sets, using digital technology for larger data sets.
Describe and interpret data displays using median, mean and range	• using mean and median to compare data sets and explaining how outliers may affect the comparison • locating mean, median and range on graphs and connecting them to real life	Determine the median for different data sets.	Describe the relationship between the median and mean in data displays.