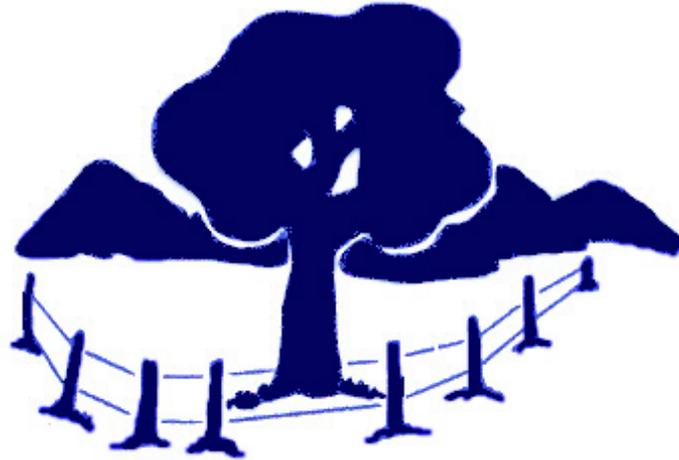# DOREEN PRIMARY SCHOOL

SCOPE & SEQUENCE CHARTS

Numeracy

Based on the Victorian Curriculum and Sound Teaching Practice.

2022

Numeracy – Victorian Curriculum

Rationale

Numeracy encompasses the knowledge, skills, behaviours and dispositions that students need to use mathematics in a wide range of situations. The Numeracy learning continuum identifies the related Mathematical knowledge and skills, and contextualises these through learning area examples.

When teachers identify numeracy demands across the curriculum, students have opportunities to transfer their mathematical knowledge and skills to contexts outside the mathematics classroom. These opportunities assist students to recognise the interconnected nature of mathematical knowledge, other learning areas and the wider world, and encourage them to use their mathematical skills broadly.

Doreen Primary School runs an Integrated Curriculum, so Mathematical Skills and Concepts can be transferred across to sessions so as children can see Mathematics in a practical world. This school also aims to give children experiences with mathematical skills and concepts by running "Maths Projects" in the Middle and Upper Grades, these Open-Ended style activities being introduced in sessions as both extension and embedding activities for all students.

At this school we will aim to teach Mathematics by;
- engaging students
- including students in their learning and including them in their progress where appropriate
- teaching sequential and developmental programs using an agreed format across the whole school
- using evaluation and data to drive activities and programs
- using agreed resources and colleague interaction and expertise in planning
- prepare students with the skills and concepts needed before asking them to take on open-ended and extension activities

Numeracy across the Curriculum

In the Victorian Curriculum, much of the explicit teaching of numeracy skills occurs in Mathematics. Being numerate involves more than the application of routine procedures within the mathematics classroom. Students need to recognise that mathematics is constantly used outside the mathematics classroom and that numerate people apply general mathematical skills in a wide range of familiar and unfamiliar situations.

Using mathematical skills across the curriculum both enriches the study of other learning areas and contributes to the development of a broader and deeper understanding of numeracy. Therefore, a commitment to numeracy development is an essential component of learning areas across the curriculum and a responsibility for all teachers. This requires that teachers:
- identify the specific numeracy demands of their learning area
- provide learning experiences and opportunities that support the application of students' general mathematical knowledge and skills
- Use the language of numeracy in their teaching as appropriate.

Teachers should be aware of the correct use of mathematical language in their own learning areas. Understanding mathematical terminology and the specific uses of language in mathematics is essential for numeracy.

The Numeracy capability is addressed through the learning areas and is identified wherever it is developed or applied in content descriptions. It is also identified where it offers opportunities to add depth and richness to student learning in content elaborations. An icon indicates where Numeracy has been identified in learning area content descriptions and elaborations. A filter function on the Australian Curriculum website assists users to find where Numeracy has been identified in F–10 curriculum content. Teachers may find further opportunities to incorporate explicit teaching of Numeracy depending on their choice of activities. Students can also be encouraged to develop capability through personally relevant initiatives of their own design

FOUNDATION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	LEVEL 6
NUMBER AND ALGEBRA						
NUMBER AND PLACE VALUE						
Establish Understanding **Language** and processes of counting **Naming numbers** in sequence to and from 20 – random starting point **Connect** names, numerals & quantities – 10 then beyond – including zero **Model** addition & sharing in practical situations **Compare**, order & correspond using collections – 20 then beyond **Reasoning** for collections	**Develop Confidence** **Sequences** to and from 100 by 1's random start **Skip Count** 2's, 5's, 10's from zero then random **Recognise**, model, read, write and order to at least 100 use number lines **Count** collections to at least 100 – use grouping **Solve** & represent simple equations in + and – **Use strategies** such as counting on, grouping and rearranging parts in + & -	**Investigate Number** **Sequencing** by increasing and decreasing 2's, 5's, 10's from random starting points **Recognise** model, represent & order numbers to at least 1000 **Group**, partition& rearrange collections to at least 1000 **Count** using 1's, 10's, 100's for more efficiency **Connections** between + & - and solve simple problems both mentally and written **Make groups** and arrays to demonstrate repeated + as x (multiplication) **Recognise** & represent division as equal sets & solve simple problems	**Investigate Conditions** **Identify** odd and even numbers and the conditions required **Recognise**, model , represent & order numbers to at least 10000 **Apply** place value to assist in calculations & to solve problems to at least 10000 **Explain** and recognise the connections between + & - **Recall** & increase efficient mental strategies for better computation **Tables** for at least 2,3,5,10's with related division facts **Solve** problems that also include x using mental and written strategies/digital technologies.	**Develop Strategies** **Recall** x facts to at least 10 X 10 with related division facts **Properties** of odd and even numbers and their uses **Recognise**, represent & order numbers to at least 10's of 1000 **Apply** place value to partition, rearrange and regroup numbers to at least 10's of 1000's to assist in calculations **Investigate** number sequences with multiples of 3,4,5,6,7,8 & 9 **Develop** further mental and written strategies /digital technologies for x and ÷ with no remainder	**Problems and Calculations** **Identify** & describe factors and multiples of whole numbers to solve problems **Estimate** and round off to check reasonableness of answers **Multiplication** of large numbers by 1 & 2 digit numbers using mental, written or digital strategies **Division** by a 1 digit number including remainders **Strategies** – solve using efficient mental, written or digital technologies appropriate to the problem **Recognise,** represent and order numbers to at least hundreds of thousands.	**Investigate and Solve** **Identify** and describe properties of prime, composite, square & triangular numbers **Select** and apply efficient mental & written strategies & appropriate digital technologies to solve problems involving all 4 operations with whole numbers. **Investigate** everyday situations that use integers. **Locate** and represent these numbers on a number line.
THE FOUR PROCESSES + - x ÷						
Represent practical situations to model + and – **Skip Count** by twos, fives and tens starting from zero **Represent** practical situations to model sharing	**Represent** and solve simple + and - problems using a range of strategies including counting on, partitioning and rearranging parts **Investigate** and describe number patterns formed by skip counting. Investigate number sequences initially those increasing and decreasing by 2's,3's,5's, and 10's from any starting point, then moving to other sequences.	**Explore** the connection between + and – **Describe** patterns with numbers and identify missing elements. **Solve** simple + and – problems using a range of efficient mental and written strategies. **Solve** problems by using number sentences for + and -. **Recognise** and represent x as repeated + groups and arrays	**Recognise** and explain the connection between + and -. **Recall** + facts for single digit numbers and related – facts to develop increasingly efficient mental strategies for computation. **Describe**, continue and create number patterns resulting from performing + and -. **Recall** x facts of 2's, 3's,5's, 10's and related ÷ facts.	**Use equivalent** number sentences involving addition and subtraction to find unknown quantities **Investigate** number sequences involving multiples of 3, 4, 6, 7, 8 and 9. **Recall** x facts up to 10 x 10 and related ÷ facts. **Develop** efficient mental and written strategies and use appropriate digital technologies for x and ÷ where there is no remainder	**Use estimation** and rounding to check the reasonableness of answers to calculations. **Describe**, continue and create patterns with fractions, decimals and whole numbers resulting from + and -. **Identify** and describe factors ad multiples of whole numbers and use them to solve problems. **Use estimation** ad rounding to check the reasonableness of answers	**Select and apply** efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers **Add and Subtract decimals** , with and without digital technologies, and use estimation and rounding to check the reasonableness of answers. **Select and apply** efficient mental and written strategies and appropriate

		Recognise and represent division as grouping into equal sets and solve simple problems using these representations.	Represent and solve problems including x using efficient mental and written strategies ad appropriate digital technologies. **Investigate** the conditions required for a umber to be odd or even an identify odd and even numbers. **Recall** x facts of 2,3,5, and 10 and related ÷ facts.	**Explore** and describe number patterns resulting from performing x **Solve** word problems by using number sentences involving x or ÷ where there is no remainder.	to calculations. **Use estimation** and rounding to check the reasonableness of answers. **Use equivalent** number sentences involving x and ÷ to find unknown quantities. **Solve problems** involving ÷ by a one digit number, including those that result in a remainder	digital technologies to solve problems involving all four operations with whole numbers **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. Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole Numbers.
	Represent practical situations to model sharing					

FRACTIONS AND DECIMALS

	Recognise and describe one half as one of two equal parts	**Recognise** and interpret common uses of halves, quarters and eighths of shapes and collections	**Model** and represent unit fractions including ½, ¼, 1/3, 1/5 and their multiples to a complete whole	**Investigate** equivalent fractions used in contexts. **Count** by ½, 1/4, 1/3's including with mixed numeral. **Locate** and represent these fractions on a number line **Recognise** that the place value system can be extended to tenths,	**Compare** and Order common unit fractions, locate and represent them on a number line **Investigate strategies** to solve problems involving addition and subtraction of fractions with the same denominator **Place value** can extended beyond hundredths	**Compare** fractions with related denominators, locate and represent them on a number line **Solve** problem involving + & - with same or related denominators **Add & Subtract** decimals with and without digital technologies and use estimation and rounding to
				hundredths. **Make Connections** between fractions & decimals	**Compare,** order and represent decimals also on a number line.	check the reasonableness of answers **Multiply** decimals by whole numbers and perform divisions by no whole numbers where the results are terminating decimals with and without digital technologies. **Divide** and Multiply decimals by powers of 10

						Make Connections between equivalent fractions, decimals and percentages.

MONEY & FINANCIAL MATTERS

Represent simple everyday financial situations involving money.	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 5 cents	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

Sort and classify familiar objects and explain the basis for these classifications, Copy continue and create patterns with objects and drawings. Follow a short sequence of instructions.	Investigate and Describe number patterns formed by skip counting and patterns with objects. Recognise the importance of repetition of a process in solving problems	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. Apply repetition in arithmetic operations, including multiplication as repeated addition and division as repeated subtraction. Use a function machine and the inverse machine as a model to apply mathematical rules to numbers or shapes.	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 Define a simple class of problems and use an effective algorithm that involves a short sequence of steps and decisions to solve them.	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 Follow a mathematical algorithm involving branching and repetition (iteration).	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 Design algorithms involving branching and iteration to solve specific classes of mathematical problems.

MEASUREMENT AND GEOMETRY

UNITS OF MEASURE

Use direct and indirect comparisons to decide which is longer, heavier or holds more and explain reasoning in everyday lang Compare and order the	Measure and Compare Lengths and capacities of pairs of objects using uniform informal units Tell time to the half hour Describe duration using	Compare and order Shapes and objects based on length, area, volume and capacity using appropriate uniform informal units.	Measure, order and compare objects using familiar metric units of length, mass and capacity Tell time to the minute and investigate the relationship	Use scaled instruments to measure and compare lengths, masses capacities and temperatures Convert between units of time	Choose appropriate units of measurement for length, area, volume, capacity and mass. Calculate the perimeter and area of rectangles	Connect decimal representations to the metric system Covert between common metric units of length, mass and capacity

duration of events using everyday language of time **Connect** days of the week to familiar events and actions	months, weeks, days and hours.	**Compare masses** of objects using balance scales **Tell time** to the ¼ 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	between units of time	**Use am and pm** notation and solve simple time problems **Compare** objects using familiar metric units of area and volume	using familiar metric units **Compare** 12 and 24 hour time systems and convert between them	**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 **Time** – Measure, calculate and compare elapsed time.

SHAPE

Sort, describe and name familiar 2D shapes and 3D objects in the environment	**Recognise** and classify familiar 2D and 3D objects using obvious features **Measure and compare** the lengths, masses and capacities of pairs of objects using informal units.	**Describe** and draw 2D shapes with and without digital technologies. **Describe** and draw features of 3D objects **Measure,** order and compare objects using familiar metric units of length, area, mass and capacity	**Make models** of 3D objects and describe key features **Explain and compare** the geometric properties of two dimensional shapes ad three dimensional objects. **Compare objects** using familiar metric units of area and volume.	**Compare** the areas of regular and irregular shapes by informal means **Compare and describe** 2D shapes that result from combining and splitting common shapes with and without the use of digital technologies	**Connect 3D objects** with their nets and other 2D representations **Calculate the perimeter** and area of rectangles and the volume and capacity of prisms using familiar metric units	**Construct** simple prisms and pyramids **Connect** volume and capacity and their units of measurement. **Connect** decimal representations to the metric system. **Convert** between common metric units of length, mass and capacity

LOCATION, SYMMETRY, ANGLES AND TRANSFORMATION

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 1-step slides and flips with and without digital technologies **Identify** and describe ½ and ¼ turns	**Create** and interpret simple grid maps to show position and pathways **Identify** symmetry in the environment **Identify** and describe slides ad tunes found in the natural and built environment.	**Use simple scales** and 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 2D objects **Identify** line and rotational symmetries **Apply** the enlargement transformation to familiar 2d 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 co ordinate system using all 4 quadrants

GEOMETRIC REASONING

			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

STATISTICS AND PROBABILITY

Answer yes/no questions to collect information **Organise** answers to yes/no questions into simple data displays using objects and drawings. **Interpret** simple data displays about yes/no questions.	**Identify outcomes** of familiar events involving chance and describe them using everyday language which as "will happen" "won't happen" or "might happen" **Choose** simple questions and gather responses **Represent data** with objects and drawings where 1 object or drawing represents 1 data value **Describe** the displays	**Identify** practical activities and everyday events that involve chance. **Describe outcomes** as "likely" or "unlikely" and identify some events as "certain" or "impossible" **Identify** a question of interest based on 1 categorical variable **Gather data** relevant to the question **Collect,** check and classify data **Create displays** of data using lists, table and	**Conduct** chance experiments, identify and describe possible outcomes and recognise variation in results. **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	**Describe** possible everyday events and order their chances of occurring **Identify** everyday events where 1 cannot happen if the other happens. **Identify** events where the chance of 1 will not be affected by the occurrence of the other **Select and trial** methods for data collection, including survey questions and recording sheets. **Construct** suitable data displays, with and without	**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 **Pose** questions and collect categorical or numerical data by observation or survey **Construct** displays, including column graphs, dot plots and tables,	**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. **Construct,** **Interpret and compare** a range of data displays, including side by side column graphs for 2

		picture graphs and interpret them	technologies **Interpret** and compare data displays	the use of digital technologies, from given or collected data **Include tables**. Column graphs and picture graphs where 1 picture can represent many data values **Evaluate** the effectiveness of different displays in illustrating data features including variability	appropriate for data type with and without the use of digital technologies **Describe** and interpret different data sets in context.	categorical variables. **Interpret** secondary data presented in digital media and elsewhere **Pose and refine** questions to collect categorical or numerical data by observation or survey

Evaluation	Resources
As per the Doreen Primary School Evaluation Policy. Where appropriate, results should be shared with students so as they can understand areas for goal setting and developing programs for learning and improvement.	These can be found in classrooms, the Library or via the Maths Co-ordinator
1. Diagnostic tests designed by Classroom Teacher 2. Term based Tests 3. PAT Maths in November 4. NAPLAN results 5. Study ladder testing.	1. Maths Plus Booklets 2. MAV Membership 3. Varied resources in teacher reference section in Library 4. DPS year Planners 5. Study Ladder 6. Maths Mentals