

# Mathletics Victorian Program of Studies Understanding Practice and Fluency (UPF)



Years 3 – 6  
October, 2021

Mathletics

# Mathletics

Victoria Program of Studies

Understanding, Practice and Fluency (UPF)

October 2021

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# Year 3

## 1 Number and Algebra

### 1.1 Number and place value

Outcome	Quests	Content
129. Investigate the conditions required for a number to be odd or even and identify odd and even numbers	Odd and even numbers	Exploring odd and even numbers
130. Recognise, model, represent and order numbers to at least 10 000	Numbers to 10 000	Identifying and counting numbers to 4 digits
		Reading and representing numbers: up to 4 digits
		Comparing and ordering numbers to 10 000
131. Apply place value to partition, rearrange and regroup numbers to at least 10 000 to assist calculations and solve problems	Place value and partitioning	Place value up to 4-digits
		Rounding numbers: 4 digits
132. Recognise and explain the connection between addition and subtraction	Addition and subtraction	Relationship between addition and subtraction
133. Recall addition facts for single-digit numbers and related subtraction facts to develop increasingly efficient mental strategies for computation	Addition & subtraction facts/strategies	Add/subtract: single digit numbers
		Add/subtract: 2 & 3-digit using jump strategy
		Add/subtract: 2- & 3-digit using place value
		Add/subtract: 2- & 3-digit using bridging to 10
		Add/subtract: bridging with unknowns
		Add/subtract: 3-digits using partitioning
		Add/subtract: 3-digits using place value
		Add/subtract: 2- & 3-digit using split strategy
		Add/subtract: rounding & compensation
		Add/subtract: to and from 100
		Add/subtract: multiples of 100, 1000 & 10 000
		Add/subtract: using non-standard partitioning
		Add/subtract: choosing efficient strategies

		Add/subtract: estimating
134. Recall multiplication facts of two, three, five and ten and related division facts	Skip counting	Skip counting by 10 to 1000
		Skip counting by 2 to 1000
		Skip counting by 5 to 1000
		Skip counting by 3 to 1000
		Skip counting by 4 to 40
	Multiplication & division facts	Multiplication/division facts for 2
		Multiplication/division facts for 10
		Multiplication/division facts for 5
		Multiplication/division facts for 2, 5, 10
		Multiplication/division facts for 3
135. Represent and solve problems involving multiplication using efficient mental and written strategies and appropriate digital technologies	Multiplication word problems	Writing & solving multiplication word problems
		Word problems and missing numbers

## 1.2 Fractions and decimals

136. Model and represent unit fractions including $\frac{1}{2}$ , $\frac{1}{4}$ , $\frac{1}{3}$ , $\frac{1}{5}$ and their multiples to a complete whole	Fractions	Using fractions: halves, quarters & eighths
		Numerator and denominator
		Using fractions: halves, thirds & quarters
		Using fractions: thirds & sixths
		Using fractions: fifths

## 1.3 Money and financial mathematics

137. Represent money values in multiple ways and count the change required for simple transactions to the nearest five cents	Money	Making purchases and calculating change
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## 1.4 Patterns and algebra

138. Describe, continue, and create number patterns resulting from performing addition or subtraction	Number patterns	Identifying and creating number patterns
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139. Use a function machine and the inverse machine as a model to apply mathematical rules to numbers or shapes	Function machines	Function machines with numbers
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## 2 Measurement and Geometry

### 2.1 Using units of measurement

Outcome	Quests	Content
140. Measure, order and compare objects using familiar metric units of length, area, mass and capacity	Length, mass and capacity	Comparing, ordering and measuring length
		Measure & compare units of volume & capacity
		Using the kilogram to measure mass

### 2.2 Shape

Outcome	Quests	Content
141. Tell time to the minute and investigate the relationship between units of time	Telling time	Telling time to the minute
142. Make models of three-dimensional objects and describe key features	3D objects	Exploring prisms and nets
		Rectangular prism nets

### 2.3 Location and transformation

Outcome	Quests	Content
143. Create and interpret simple grid maps to show position and pathways	Grid referenced maps	Interpreting and creating grid referenced maps
144. Identify symmetry in the environment	Lines of symmetry	Recognising and drawing lines of symmetry

### 2.4 Geometric reasoning

Outcome	Quests	Content
146. Identify angles as measures of turn and compare angle sizes in everyday situations	Identifying and comparing angles	Identifying and comparing angles
		Introducing angles



## 3 Statistics and Probability

### 3.1 Chance

Outcome	Quests	Content
147. Conduct chance experiments, identify and describe possible outcomes and recognise variation in results	Conducting chance experiments	Conducting chance experiments
		Category data
149. 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	Collecting and organising data	Statistical investigations
		Representing and interpreting data displays

# Year 4

## 1 Number and Algebra

### 1.1 Number and place value

Outcome	Quests	Content
151. Investigate and use the properties of odd and even numbers	Properties of odd and even numbers	Odd and even numbers
152. Recognise, represent and order numbers to at least tens of thousands	Numbers up to 5 digits	Comparing and ordering numbers up to 5 digits
		Place value up to 5 digits
		Using place value to partition: up to 5 digits
		Rounding numbers: 5 digits
153. Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problem	Addition and subtraction strategies	Representing problems using a bar model
		Add/subtract: efficient strategies
		Addition algorithms (without regrouping)
		Addition algorithms (with regrouping)
		Addition algorithms (with/without regrouping)
		Subtraction algorithms (without decomposing)
		Subtraction algorithms (with decomposing)
		Add/subtract: word problems
154. Investigate number sequences involving multiples of 3, 4, 6, 7, 8, and 9	Investigating sequences with multiples	Investigating sequences with multiples
155. Recall multiplication facts up to $10 \times 10$ and related division facts	Multiplication and division facts	Multiplication/division facts for 4
		Multiplication/division facts up to 5
		Multiplication and division facts and properties
		Exploring multiplication/division for 6 up to 60
		Exploring multiplication/division for 7 up to 70
		Exploring multiplication/division for 8 up to 80

		Exploring multiplication /division for 9 up to 90
156. Develop efficient mental and written strategies and use appropriate digital technologies for multiplication and for division where there is no remainder	Mult and div strategies, no remainder	Using facts to multiply using 2-digits
		Using facts to divide 3-digit numbers by 10
		Multiplication strategies using 1-digit
		Using the conventions of multiplication
		Multiples and factors up to 100
		Inverse facts
		Practising multiplication strategies
		Multiplying 2-digit numbers by a 1-digit number
		Multiplying 2-digit numbers using doubling
		Multiplying 2-digits using factorising
		Selecting effective multiplication strategies
		Comparisons using the language of multiplication
		Dividing a 2-digit number by a 1 digit number

## 1.2 Fractions and decimals

Outcome	Quests	Content
157. Investigate equivalent fractions used in contexts	Equivalent fractions	Investigating equivalent fractions
158. Count by quarters, halves and thirds, including with mixed numerals. Locate and represent these fractions on a number line	Counting in fractions	Counting in halves and quarters
		Counting in thirds
		Using mixed numbers on a number line
159. Recognise that the place value system can be extended to tenths and hundredths. Make connections between fractions and decimal notation	Place value: counting in tenths/hundredths	Using decimal tenths
		Using decimal hundredths
		Partitioning decimal hundredths
		Connecting decimal fractions and common fractions

### 1.3 Money and financial mathematics

Outcome	Quests	Content
160. Solve problems involving purchases and the calculation of change to the nearest five cents with and without digital technologies	Solving money problems	Addition and subtraction money problems
161. Explore and describe number patterns resulting from performing multiplication	Exploring number patterns	Exploring number patterns
162. Solve word problems by using number sentences involving multiplication or division where there is no remainder	Multiplication & division: word problems	Mult/div: Solving word problems
163. Use equivalent number sentences involving addition and subtraction to find unknown quantities	Addition & subtraction: number sentences	Using number sentences to find unknown quantities

## 2 Measurement and Geometry

### 2.1 Using units of measurement

Outcome	Quests	Content
165. Use scaled instruments to measure and compare lengths, masses, capacities and temperatures	Length, mass, capacity and temperature	Metric units of length
		Length and 3D objects
		Introducing perimeter
		Temperature
		Measuring capacity in millilitres
166. Compare objects using familiar metric units of area and volume	Area and volume	Comparing area using metric units
		Using cubic cm to measure volume
167. Convert between units of time	Converting units of time	Converting units of time
168. Use am and pm notation and solve simple time problems	AM/PM and elapsed time	AM/PM and elapsed time problems

### 2.2 Shape

Outcome	Quests	Content
169. Compare the areas of regular and irregular shapes by informal means	Area of regular and irregular shapes	Measuring & comparing regular and irregular shapes
170. Compare and describe two dimensional shapes that result from combining and splitting common shapes, with and without the use of digital technologies	Composing and decomposing 2D shapes	Composing and decomposing 2D shapes

### 2.3 Location and transformation

Outcome	Quests	Content
172. Use simple scales, legends and directions to interpret information contained in basic maps	Scales, legends and directions	Using legends and cardinal compass directions
		Solving measurement problems
173. Create symmetrical patterns, pictures and shapes with and without digital technologies	Symmetrical patterns, pictures & shapes	Introducing transformations
		Creating and drawing symmetrical designs
		Recognising tessellations

## 2.4 Geometric reasoning

Outcome	Quests	Content
174. Compare angles and classify them as equal to, greater than or less than a right angle	Classifying angles	Classifying angles

## 3 Statistics and Probability

### 3.1 Chance

Outcome	Quests	Content
175. Describe possible everyday events and order their chances of occurring	Chance events	Describing the chance of events occurring
176. Identify everyday events where one cannot happen if the other happens	Non-simultaneous everyday events	Exploring non-simultaneous everyday events
177. Identify events where the chance of one will not be affected by the occurrence of the other	Independent and dependent events	Independent and dependent events

### 3.2 Data representation and interpretation

Outcome	Quests	Content
178. Select and trial methods for data collection, including survey questions and recording sheets	Trial methods for data collection	Surveys and sorting data
179. 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	Constructing suitable data displays	Column graphs using many-to-one correspondence
		Picture graphs with many-to-one correspondence
180. Evaluate the effectiveness of different displays in illustrating data features including variability	Evaluating and comparing data displays	Evaluating and comparing data displays

# Year 5

## 1 Number and Algebra

### 1.1 Number and place value

Outcome	Quests	Content
181. Identify and describe factors and multiples of whole numbers and use them to solve problems	Multiples, factors and divisibility test	Multiples and factors
		Divisibility tests
182. Use estimation and rounding to check the reasonableness of answers to calculations	Estimating and rounding	Checking with estimation and rounding
		Rounding to estimate products and quotients
183. Solve problems involving multiplication of large numbers by one- or two-digit numbers using efficient mental, written strategies and appropriate digital technologies	Multiplication	Multiplication using multiples of 10
		Mult: rounding, compensating and partitioning
		Mult: doubling, halving and thirding
		Multiplying using the split method
		Multiplying by factorising
		Multiplying using an area model
		Multiplying using formal algorithms
		Multiplication word problems
184. Solve problems involving division by a one digit number, including those that result in a remainder	Division	Division using partitioning
		Extended division - no remainders or zeros
		Extended division - remainders
		Extended division - with and without remainders
		Contracted division - no remainders or zeros
		Contracted division - no remainders
		Contracted division - with and without remainders
		Division word problems
185. Use efficient mental and written strategies and apply appropriate digital	Addition and subtraction	Adding numbers of any size
		Subtracting numbers of any size



technologies to solve problems		Adding and subtracting numbers of any size
186. Recognise, represent and order numbers to at least hundreds of thousands	Recognising/representing/ordering number	Reading, comparing and ordering numbers
		Representing numbers using place value

## 1.2 Fractions and decimals

Outcome	Quests	Content
187. Compare and order common unit fractions and locate and represent them on a number line	Comparing/ordering common unit fractions	Compare and order common unit fractions
188. Investigate strategies to solve problems involving addition and subtraction of fractions with the same denominator	Addition and subtraction: fractions	Adding and subtracting proper fractions
		Add & subtract fractions - common denominators
189. Recognise that the place value system can be extended beyond hundredths	Place value to thousandths	Place value to thousandths
190. Compare, order and represent decimals	Compare and order decimals	Compare and order decimals

## 1.3 Patterns and algebra

Outcome	Quests	Content
192. Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction	Number patterns-addition and subtraction	Number patterns-addition and subtraction
193. Use equivalent number sentences involving multiplication and division to find unknown quantities	Number sentences-mult and div	Number sentences-mult and div
194. Follow a mathematical algorithm involving branching and repetition (iteration)	Algorithms with branching or repetition	Using branching and repetition

## 2 Measurement and Geometry

### 2.1 Using units of measurement

Outcome	Quests	Content
195. Choose appropriate units of measurement for length, area, volume, capacity and mass	Length, area, volume, capacity and mass	Comparing and ordering metric lengths
196. Calculate the perimeter and area of rectangles and the volume and capacity of prisms using familiar metric units	Perimeter, area and volume of rectangles	Calculating perimeter of rectangles
		Calculating the area of rectangles
197. Compare 12- and 24-hour time systems and convert between them	24-hour time	Using 24-hour time

### 2.2 Shape

Outcome	Quests	Content
198. Connect three-dimensional objects with their nets and other two-dimensional representations	Nets	Nets

### 2.3 Location and transformation

Outcome	Quests	Content
199. Use a grid reference system to describe locations. Describe routes using landmarks and directional language	Grid reference and directional language	Grid-referenced maps
		Using landmarks and directional language
200. Describe translations, reflections and rotations of two-dimensional shapes. Identify line and rotational symmetries	Transformations and symmetry	Rigid transformations
		Symmetry
201. Apply the enlargement transformation to familiar two dimensional shapes and explore the properties of the resulting image compared with the original	Enlarging 2D shapes	Enlarging 2D shapes
		Classifying and constructing angles

## 3 Statistics and Probability

### 3.1 Chance

Outcome	Quests	Content
203. List outcomes of chance experiments involving equally likely outcomes and represent probabilities of those outcomes using fractions	Outcomes of chance experiments	Outcomes of chance experiments
204. Recognise that probabilities range from 0 to 1	Probability	Probabilities from 0 to 1

### 3.2 Data representation and interpretation

Outcome	Quests	Content
205. Pose questions and collect categorical or numerical data by observation or survey	Categorical and numerical data	Categorical and numerical data
206. Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies	Constructing data displays	Constructing data displays
207. Describe and interpret different data sets in context	Describing and interpreting data sets	Describing and interpreting data sets

# Year 6

## 1 Number and Algebra

### 1.1 Number and place value

Outcome	Quests	Content
208. Identify and describe properties of prime, composite, square and triangular numbers	Properties of numbers	Square and triangular numbers
		Prime and composite numbers
209. Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers and make estimates for these computations	Operations with whole numbers	Addition and subtraction word problems
		Multiplying and dividing by multiples of 10
		Selecting efficient mult/div strategies
		Division problems
		Multiplication and division word problems
210. Investigate everyday situations that use integers. Locate and represent these numbers on a number line	Integers	Investigating and interpreting integers

### 1.2 Fractions and decimals

Outcome	Quests	Content
211. Compare fractions with related denominators and locate and represent them on a number line	Fractions with related denominators	Working with fractions
212. Solve problems involving addition and subtraction of fractions with the same or related denominators	Adding and subtracting fractions	Add & subtract fractions-related denominators
		Add and subtract fractions and mixed numerals
213. Find a simple fraction of a quantity where the result is a whole number, with and without digital technologies	Finding a fraction of a quantity	Finding a fraction of a quantity
214. Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers	Adding and subtracting decimals	Adding decimals
		Subtracting decimals
215. Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the	Multiplying and dividing decimals	Multiplying decimals
		Dividing decimals

results are terminating decimals, with and without digital technologies		
216. Multiply and divide decimals by powers of 10	Mult/div decimals by powers of 10	Mult/div decimals by powers of 10
217. Make connections between equivalent fractions, decimals and percentages	Fractions, decimals, and percentages	Representing fractions, decimals and percentages
		Fraction, decimal and percentage equivalence

### 1.3 Money and financial mathematics

Outcome	Quests	Content
218. Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies	Calculating percentages	Calculating percentages

### 1.4 Patterns and algebra

Outcome	Quests	Content
219. Continue and create sequences involving whole numbers, fractions and decimals. Describe the rule used to create the sequence	Number sequences	Continuing and creating number sequences
220. Explore the use of brackets and order of operations to write number sentences	Order of operations	Order of operations - no brackets
		Order of operations using grouping symbols
221. Design algorithms involving branching and iteration to solve specific classes of mathematical problems	Algorithms and flowcharts	Design algorithms & flowcharts to solve problems

## 2 Measurement and Geometry

### 2.1 Using units of measurement

Outcome	Quests	Content
222. Connect decimal representations to the metric system	Connecting decimals to the metric system	Decimal notation and the metric system
		Decimal representation in capacity
		Decimal representation in mass
223. Convert between common metric units of length, mass and capacity	Converting units of length/capacity/mass	Converting metric units of length
		Converting metric units of capacity
224. Solve problems involving the comparison of lengths and areas using appropriate units	Length and area	Length problems
		Calculating the area of triangles
226. Interpret and use timetables	Using timetables	Using timetables

### 2.2 Location and transformation

Outcome	Quests	Content
229. Investigate the effect of combinations of transformations on simple and composite shapes, including creating tessellations, with and without the use of digital technologies	Rigid transformations	Rigid transformations

### 2.3 Geometric reasoning

Outcome	Quests	Content
231. 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	Angle properties	Adjacent and vertically opposite angles

## 3 Statistics and Probability

### 3.1 Chance

Outcome	Quests	Content
232. Describe probabilities using fractions, decimals and percentages	Probability: fraction, decimal or percent	Probability: fraction, decimal or percent
233. Conduct chance experiments with both small and large numbers of trials using appropriate digital technologies	Chance experiments	Chance experiments
234. Compare observed frequencies across experiments with expected frequencies	Frequency/fairness in chance experiments	Frequency/fairness in chance experiments

### 3.1 Data representation and interpretation

Outcome	Quests	Content
235. Construct, interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables	Interpreting/representing/comparing data	Two-way tables
		Side-by-side column graphs
		Comparing & selecting bivariate data displays
236. Interpret secondary data presented in digital media and elsewhere	Interpreting & evaluating secondary data	Interpreting & evaluating secondary data
237. Pose and refine questions to collect categorical or numerical data by observation or survey	Posing/evaluating statistical questions	Posing/evaluating statistical questions

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