

Mathletics

White Rose Maths (WRM)

Understanding Practice and Fluency (UPF)



Years 3 – 6

November, 2021

Mathletics

Mathletics

WRM Program of Studies

Understanding, Practice and Fluency (UPF)

November 2021

Grade 3	4
1 Number and Place Value.....	4
2 Addition and Subtraction.....	5
3 Multiplication and Division — A.....	6
4 Multiplication and Division — Sp	7
5 Measurement — Sp(1).....	8
6 Statistics	9
7 Measurement — Sp(2).....	10
8 Fractions, Decimals and Percentages — Sp.....	11
9 Fractions, Decimals and Percentages — Su.....	12
10 Measurement — Su(1)	13
11 Geometry – Properties of Shape	14
12 Measurement — Su(2)	15
Grade 4	16
1 Number and Place Value.....	16
2 Addition and Subtraction.....	17
3 Measurement – A.....	18
4 Multiplication and Division – A.....	19
5 Measurement.....	20
6 Fractions, Decimals and Percentages.....	21
7 Measurement.....	22
8 Statistics	23
9 Geometry – Properties of Shape.....	24
10 Geometry – Position and Direction.....	25
Grade 5	26
1 Number and Place Value.....	26
2 Addition and Subtraction.....	27
3 Statistics	28
4 Multiplication and Division – A.....	29
5 Measurement.....	30
6 Multiplication and Division – Sp	31
7 Fractions, Decimals and Percentages – Sp.....	32
8 Fractions, Decimals and Percentages — Su.....	33
9 Geometry – Properties of Shape.....	34
10 Geometry – Position and Direction.....	35

11 Measurement — Su.....	36
Grade 6	37
1 Number and Place Value.....	37
2 Addition, Subtraction, Multiplication and Division.....	38
3 Fractions, Decimals and Percentages — A.....	39
4 Geometry – Position and Direction	40
5 Fractions, Decimals and Percentages — Sp.....	41
6 Algebra.....	42
7 Measurement.....	43
8 Ratio and Proportion	44
9 Statistics	45
10 Geometry – Properties of Shapes	46

Grade 3

1 Number and Place Value

Outcome	Quests	Content
Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number	Place value A1a	Hundreds
Identify, represent and estimate numbers using different representations	Place value A1b	Numbers to 1,000
Recognise the place value of each digit in a 3-digit number (100s, 10s, 1s)	Place value A1c	100s, 10s and 1s
Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number	Place value A1d	Number line to 1,000
		Find 1, 10 or 100 more or less than a number
Compare and order numbers up to 1,000	Place value A1e	Compare objects to 1,000
		Compare numbers to 1,000
		Order numbers
Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number	Place value A1f	Count in 50s

2 Addition and Subtraction

Outcome	Quests	Content
Add and subtract numbers mentally, including: a three-digit number and 1s, a three-digit number and 10s, a three-digit number and 100s	Addition and subtraction A2a	Add and subtract multiples of 100
		Add/subtract 3 and 1-digit numbers-not crossing 10
		Add 3-digit and 1-digit numbers - crossing 10
		Subtract 1-digit number from 3-digit - crossing 10
		Add/subtract 3- & 2-digit numbers-not crossing 100
		Add 3-digit and 2-digit numbers - crossing 100
		Subtract 2 and 3-digit numbers - crossing 100
		Add and subtract 100s
		Spot the pattern - making it explicit
Add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction	Addition and subtraction A2b	Add/subtract 2/3-digit numbers-not crossing 10/100
		Add 2 and 3-digit numbers - crossing 10 or 100
		Subtract 2-digits from 3-digits crossing 10 or 100
		Add two 3-digit numbers - not crossing 10 or 100
		Add two 3-digit numbers - crossing 10 or 100
		Subtract 3-digit numbers - no exchange
		Subtract 3-digit numbers - exchange
Estimate the answer to a calculation and use inverse operations to check answers	Addition and subtraction A2c	Estimate answers to calculations
Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	Addition and subtraction A2d	Using bar models to represent problems

3 Multiplication and Division — A

Outcome	Quests	Content
Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	Multiplication and division A3	Multiplication – equal groups
		Multiply by 3
		Divide by 3
		The 3 times-table
		Multiply by 4
		Divide by 4
		The 4 times-tables
		Multiply by 8
		Divide by 8
		The 8 times-table

4 Multiplication and Division — Sp

Outcome	Quests	Content
Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods	Multiplication and division Sp1a	Comparing statements
		Related calculations
		Multiply 2-digits by 1-digit (not bridging 10)
		Multiply 2-digits by 1-digit (bridging 10)
		Divide 2-digit by 1-digit-no exchange or remainder
		Divide 2-digit by 1-digit-exchange, no remainder
Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects	Multiplication and division Sp1b	Divide 2-digits by 1-digit (with a remainder)
		Scaling
		How many ways?

5 Measurement — Sp(1)

Outcome	Quests	Content
Add and subtract amounts of money to give change, using both £ and p in practical contexts	Money Sp2	Pounds and pence
		Convert pounds and pence
		Add and subtract money
		Give change

6 Statistics

Outcome	Quests	Content
Interpret and present data using bar charts, pictograms and tables	Statistics Sp3	Pictograms
		Bar charts
		Tables

7 Measurement — Sp(2)

Outcome	Quests	Content
Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)	Length Sp4	Measure length
		Equivalent lengths - m and cm
		Equivalent lengths - mm and cm
		Compare lengths
		Add and subtract lengths
Measure the perimeter of simple 2-D shapes	Perimeter Sp4	Measure perimeter
		Calculate perimeter

8 Fractions, Decimals and Percentages — Sp

Outcome	Quests	Content
Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators	Fractions Sp5a	Unit and non-unit fractions
		Making the whole
Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10	Fractions Sp5b	Count in tenths
		Tenths as decimals
		Fractions on a number line
Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators	Fractions Sp5c	Fraction of a set

9 Fractions, Decimals and Percentages — Su

Outcome	Quests	Content
Recognise and show, using diagrams, equivalent fractions with small denominators	Fractions Su1a	Equivalent fractions
Compare and order unit fractions, and fractions with the same denominators	Fractions Su1b	Compare and order fractions
Add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$]	Fractions Su1c	Add fractions

10 Measurement — Su(1)

Outcome	Quests	Content
Know the number of seconds in a minute and the number of days in each month, year and leap year	Time Su2a	Months and years
		Hours in a day
Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, am/pm, morning, afternoon, noon and midnight	Time Su2b	Telling the time to 5 minutes
		Telling the time to the minute
		Using a.m. and p.m.
		24-hour clock
Compare durations of events [for example, to calculate the time taken by particular events or tasks]	Time Su2c	Finding the duration
		Comparing durations
		Start and end times
Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, am/pm, morning, afternoon, noon and midnight	Time Su2d	Measuring time in seconds

11 Geometry – Properties of Shape

Outcome	Quests	Content
Recognise angles as a property of shape or a description of a turn	Properties of shape Su3a	Turns and angles
Identify right angles, recognise that 2 right angles make a half-turn, 3 make three-quarters of a turn and 4 a complete turn; identify whether angles are greater than or less than a right angle	Properties of shape Su3b	Right angles in shapes
		Compare angles
Identify horizontal and vertical lines and pairs of perpendicular and parallel lines	Properties of shape Su3c	Draw accurately
		Horizontal and vertical
		Parallel and perpendicular
Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them	Properties of shape Su3d	Recognise and describe 2-D shapes
		Recognise and describe 3-D shapes
		Make 3-D shapes

12 Measurement — Su(2)

Outcome	Quests	Content
Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)	Mass Su4	Measure mass using kg & g
		Compare and order mass
		Add and subtract mass
	Capacity Su4	Measure capacity
		Compare capacity
		Add and subtract capacity

Grade 4

1 Number and Place Value

Outcome	Quests	Content
Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value	Place value A1a	Roman numerals to 100
Round any number to the nearest 10, 100 or 1,000	Place value A1b	Round to the nearest 10
		Round to the nearest 100
Count in multiples of 6, 7, 9, 25 and 1,000	Place value A1c	Count in 1,000s
		Count in multiples of 6, 7, 9, 25 and 1,000
Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)	Place value A1d	1,000s, 100s, 10s and 1s
		Partitioning
Identify, represent and estimate numbers using different representations	Place value A1e	Number line to 10,000
Find 1,000 more or less than a given number	Place value A1f	1,000 more or less
		Compare 4-digit numbers
		Order numbers up to 4-digits
Round any number to the nearest 10, 100 or 1,000	Place value A1h	Round to the nearest 1,000
Count in multiples of 6, 7, 9, 25 and 1,000	Place value A1i	Count in 25s
Count backwards through zero to include negative numbers	Place value A1j	Negative numbers

2 Addition and Subtraction

Outcome	Quests	Content
Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	Addition & subtraction A2a	Add and subtract 1s, 10s, 100s and 1,000s
		Add two 4-digit numbers - no exchange
		Add two 4-digit numbers - one exchange
		Add two 4-digit numbers - more than one exchange
		Subtract two 4-digit numbers - no exchange
		Subtract two 4-digit numbers - one exchange
		Subtract two 4-digit number - more than one exchange
Estimate and use inverse operations to check answers to a calculation	Addition & subtraction A2b	Efficient subtraction
		Estimate answers
Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	Addition & subtraction A2c	Checking strategies

3 Measurement – A

Outcome	Quests	Content
Convert between different units of measure [for example, kilometre to metre; hour to minute]	Length and perimeter A3a	Kilometres
Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres	Length and perimeter Y4A3	Perimeter on a grid
		Perimeter of a rectangle
		Perimeter of rectilinear shapes

4 Multiplication and Division – A

Outcome	Quests	Content
Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers	Multiplication and division A4a	Multiply by 10
		Multiply by 100
		Divide by 10
		Divide by 100
		Divide by 1 and itself
Recall multiplication and division facts for multiplication tables up to 12×12	Multiplication and division A4b	Multiply and divide by 6
		6 times table and division facts
		Multiply and divide by 9
		9 times table and division facts
		Multiply and divide by 7
Recall multiplication and division facts for multiplication tables up to 12×12	Multiplication and division Sp1a	11 and 12 times tables
		Multiply 3 numbers
Recognise and use factor pairs and commutativity in mental calculations	Multiplication and division Sp1b	Factor pairs
		Efficient multiplication
		Written methods
Multiply two-digit and three-digit numbers by a one-digit number using formal written layout	Multiplication and division Sp1c	Multiply 2-digits by 1-digit
		Multiply 3-digits by 1-digit
		Divide 2-digits by 1-digit - no remainders
		Divide 2-digits by 1-digit - with remainders
		Divide 3-digits by 1-digit
Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.	Multiplication and division Sp1d	Correspondence problems

5 Measurement

Outcome	Quests	Content
Find the area of rectilinear shapes by counting squares	Area Sp2	What is area?
		Counting squares
		Making shapes
		Comparing area

6 Fractions, Decimals and Percentages

Outcome	Quests	Content
Recognise and show, using diagrams, families of common equivalent fractions	Fractions Sp3a	What is a fraction?
		Equivalent fractions (1)
		Equivalent fractions (2)
		Fractions greater than 1
Count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10	Fractions Sp3b	Count in fractions
Add and subtract fractions with the same denominator	Fractions Sp3c	Add 2 or more fractions
		Subtract 2 fractions
		Subtract from whole amounts
Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number	Fractions Sp3d	Calculate fractions of a quantity
		Problem solving - calculate quantities
Recognise and write decimal equivalents of any number of tenths or hundredths	Decimals Sp4a	Recognise tenths and hundredths
	Decimals Sp4b	Tenths as decimals
		Tenths on a place value grid
		Tenths on a number line
Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths	Decimals Sp4c	Divide 1-digit by 10
		Divide 2-digit by 10
		Hundredths
Recognise and write decimal equivalents of any number of tenths or hundredths	Decimals Sp4d	Hundredths as decimals
		Hundredths on a place value grid
Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths	Decimals Sp4e	Divide 1 or 2-digits by 100
Recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$	Decimals Su1a	Make a whole
		Write decimals
Compare numbers with the same number of decimal places up to two decimal places	Decimals Su1b	Compare and order decimals
Round decimals with one decimal place to the nearest whole number	Decimals Su1c	Round decimals
Recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$	Decimals Su1d	Halves and quarters

7 Measurement

Outcome	Quests	Content
Estimate, compare and calculate different measures, including money in pounds and pence	Money Su2	Pounds and pence
		Ordering money
		Estimating money
		Four operations
Convert between different units of measure [for example, kilometre to metre; hour to minute]	Time Su3a	Units of time
Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.	Time Su3b	Solving time problems
Read, write and convert time between analogue and digital 12- and 24-hour clocks	Time Su3c	Analogue to digital - 12 hour
		Analogue to digital - 24 hour

8 Statistics

Outcome	Quests	Content
Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	Statistics Su4a	Interpret charts - tables
		Interpret charts - pictograms
		Interpret charts - bar charts
		Solving problems using charts
Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs	Statistics Su4b	Comparison, sum & difference
Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	Statistics Su4c	Line graphs

9 Geometry – Properties of Shape

Outcome	Quests	Content
Identify acute and obtuse angles and compare and order angles up to two right angles by size	Properties of shape Su5a	Identify angles
		Compare and order angles
Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes	Properties of shape Su5b	Triangles
		Quadrilaterals
Identify lines of symmetry in 2-D shapes presented in different orientations	Properties of shape Su5c	Lines of symmetry
Complete a simple symmetric figure with respect to a specific line of symmetry.	Properties of shape Su5d	Symmetric figures

10 Geometry – Position and Direction

Outcome	Quests	Content
Describe positions on a 2-D grid as coordinates in the first quadrant	Position & direction Su6a	Describe position
Plot specified points and draw sides to complete a given polygon	Position & direction Su6b	Draw on a grid
		Move on a grid
Describe movements between positions as translations of a given unit to the left/right and up/down	Position & direction Su6c	Describe movement on a grid

Grade 5

1 Number and Place Value

Outcome	Quests	Content
Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit	Place value A1a	Numbers to 10,000
Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 and 100,000	Place value A1b	Round to nearest 10, 100 and 1,000
Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit	Place value A1c	Numbers to 100,000 Compare and order numbers to 100,000
Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 and 100,000	Place value A1d	Round numbers within 100,000
Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit	Place value A1e	Numbers to a million
Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000	Place value A1f	Counting in powers of 10
Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit	Place value A1g	Compare and order numbers to one million
Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 and 100,000	Place value A1h	Round numbers to one million
Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through 0	Place value A1i	Negative numbers in context
Read Roman numerals to 1,000 (M) and recognise years written in Roman numerals.	Place value A1j	Roman numerals to 1,000

2 Addition and Subtraction

Outcome	Quests	Content
Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	Addition and subtraction A2a	Add whole numbers with more than 4 digits
		Subtract whole numbers with more than 4 digits
Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	Addition and subtraction A2b	Round to estimate and approximate
Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	Addition and subtraction A2c	Inverse operations (addition and subtraction)
		Multi-step addition and subtraction problems

3 Statistics

Outcome	Quests	Content
Solve comparison, sum and difference problems using information presented in a line graph	Statistics Y5A3	Read and interpret line graphs
		Draw line graphs
		Use line graphs to solve problems
Complete, read and interpret information in tables including timetables	Statistics Y5A3	Read and interpret tables
		Two-way tables
		Timetables

4 Multiplication and Division – A

Outcome	Quests	Content
Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers	Multiplication and division A4a	Multiples
		Factors and common factors
Establish whether a number up to 100 is prime and recall prime numbers up to 19	Multiplication and division A4b	Prime numbers
Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)	Multiplication & division A4c	Square numbers
		Cube numbers
Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000	Multiplication and division A5d	Multiply by 10, 100 and 1,000
		Divide by 10, 100 and 1,000
		Multiples of 10, 100 and 1,000

5 Measurement

Outcome	Quests	Content
Measure and calculate the perimeter of composite rectilinear shapes in cm and m	Perimeter & area A5a	Measure and calculate perimeter
Calculate and compare the area of rectangles (including squares), and including using standard units, cm^2 , m^2 and estimate the area of irregular shapes	Perimeter & area A5b	Area of rectangles
		Area of compound shapes
		Area of irregular shapes

6 Multiplication and Division – Sp

Outcome	Quests	Content
Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for 2-digit numbers	Multiplication and division Sp1a	Multiply 4-digits by 1-digit
		Multiply 2-digits (area model)
		Multiply 2-digits by 2-digits
		Multiply 3-digits by 2-digits
		Multiply 4-digits by 2-digits
Divide numbers up to 4 digits by a 1-digit number using the formal written method of short division and interpret remainders appropriately for the context	Multiplication and division Sp1b	Divide 4-digits by 1-digit (no remainders)
		Divide with remainders

7 Fractions, Decimals and Percentages – Sp

Outcome	Quests	Content
Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	Fractions Sp2a	Equivalent fractions
Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $2/5 + 4/5 = 6/5 = 1 \frac{1}{5}$]	Fractions Sp2b	Improper fractions to mixed numbers
		Mixed numbers to improper fractions
		Number sequences
Compare and order fractions whose denominators are all multiples of the same number	Fractions Sp2c	Compare and order fractions less than 1
		Compare and order fractions greater than 1
Add and subtract fractions with the same denominator and denominators that are multiples of the same number	Fractions Sp2d	Add and subtract fractions
		Add fractions within 1
		Add 3 or more fractions
		Add fractions
		Add mixed numbers
		Subtract fractions
		Subtract mixed numbers (1)
		Subtract mixed numbers (2)
Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	Fractions Sp2e	Subtract 2 mixed numbers
		Multiply unit fractions by an integer
		Multiply non-unit fractions by an integer
		Multiply mixed numbers by integers
		Fraction of an amount
Read and write decimal numbers as fractions [for example, $0.71 = 71/100$]	Decimals & percentages Sp3a	Using fractions as operators
		Decimals up to 2 d.p. and number sequence
Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	Decimals & percentages Sp3b	Decimals as fractions
		Understand thousandths
Round decimals with two decimal places to the nearest whole number and to one decimal place	Decimals & percentages Sp3c	Thousandths as decimals
		Rounding decimals
Read, write, order and compare numbers with up to three decimal places	Decimals & percentages Sp3d	Order and compare decimals
Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal	Decimals & percentages Sp3e	Understand percentages
		Percentages as fractions and decimals
		Equivalent F.D.P

8 Fractions, Decimals and Percentages — Su

Outcome	Quests	Content
Solve problems involving number up to three decimal places	Decimals Su1	Add decimals within 1
		Subtracting decimals within 1
		Complements to 1
		Adding decimals - crossing the whole
		Add decimals, same place value, crossing the whole
		Subtract decimals in the same place value
		Add decimals in different place values
		Subtract decimals in different place values
		Adding and subtracting wholes and decimals
		Decimal sequences
		Multiplying decimals by 10, 100 and 1,000
		Dividing decimals by 10, 100 and 1,000

9 Geometry – Properties of Shape

Outcome	Quests	Content
Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles	Properties of shape Su2a	Measuring angles in degrees
Draw given angles, and measure them in degrees (°) identify: angles at a point and one whole turn (total 360°), angles at a point on a straight line and 1/2 a turn (total 180°), other multiples of 90°	Properties of shape Su2b	Measuring with a protractor (1)
		Drawing accurately
Identify: angles at a point and one whole turn (total 360°), angles at a point on a straight line and 1/2 a turn (total 180°), other multiples of 90°	Properties of shape Su2c	Calculating angles on a straight line
		Calculating angles around a point
		Lengths and angles in shapes
Use the properties of rectangles to deduce related facts and find missing lengths and angles	Properties of shape Su2d	Regular and irregular polygons
Identify 3-D shapes, including cubes and other cuboids, from 2-D representations	Properties of shape Su2e	Reasoning about 3D shapes

10 Geometry – Position and Direction

Outcome	Quests	Content
Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.	Position & direction Su3	Position in the first quadrant
		Reflection with coordinates
		Translation with coordinates

11 Measurement — Su

Outcome	Quests	Content
Convert between different units of metric measure [for example, km and m; cm and m; cm and mm; g and kg; l and ml]	Converting units Su4a	Kilograms and kilometres
		Millimetres and millilitres
		Metric units
Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints	Converting units Su4b	Imperial units
Solve problems involving converting between units of time	Converting units Su4c	Converting units of time
		Timetables
Estimate volume [for example, using 1 cm ³ blocks to build cuboids (including cubes)] and capacity [for example, using water]	Volume Su5d	What is volume?
		Comparing and estimating volume
		Estimate capacity

Grade 6

1 Number and Place Value

Outcome	Quests	Content
Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit	Place value A1a	Numbers to ten million
		Compare and order any number
Round any whole number to a required degree of accuracy	Place value A1b	Round within ten million
Use negative numbers in context, and calculate intervals across zero	Place value A1c	Negative numbers

2 Addition, Subtraction, Multiplication and Division

Outcome	Quests	Content
Use their knowledge of the order of operations to carry out calculations involving the four operations	Four operations A2a	Add and subtract integers
Multiply multi-digit numbers up to 4 digits by a 2-digit whole number using the formal written method of long multiplication	Four operations A2b	Multiply up to a 4-digit number by 2-digit number
		Multiply up to a 4-digit number by 2-digit number
Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context	Four operations A2c	Short division
		Division using factors
Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context	Four operations A2d	Long division (1)
		Long division (2)
		Long division (3)
		Long division (4)
Identify common factors, common multiples and prime numbers	Four operations A2e	Common factors
		Common multiples
		Primes to 100
		Squares and cubes
Solve problems involving addition, subtraction, multiplication and division	Four operations A2f	Order of operations
Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.	Four operations A2g	Mental calculations and estimation
Solve problems involving addition, subtraction, multiplication and division	Four operations A2h	Reason from known facts

3 Fractions, Decimals and Percentages — A

Outcome	Quests	Content
Use common factors to simplify fractions; use common multiples to express fractions in the same denomination	Fractions A3a	Simplify fractions
		Fractions on a number line
Compare and order fractions, including fractions > 1	Fractions A3b	Compare and order (denominator)
		Compare and order (numerator)
Add and subtract fractions with different denominations and mixed numbers, using the concept of equivalent fractions	Fractions A3c	Add and subtract fractions
		Add fractions
		Subtract fractions
		Mixed addition and subtraction
Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]	Fractions A3d	Multiply fractions by integers
		Multiply fractions by fractions
Divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$]	Fractions A3e	Divide fractions by integers
		Four rules with fractions
Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$]	Fractions A3f	Fraction of an amount
		Fraction of an amount - find the whole

4 Geometry – Position and Direction

Outcome	Quests	Content
Describe positions on the full coordinate grid (all four quadrants)	Position and direction A4a	The first quadrant
		Four quadrants
Draw and translate simple shapes on the coordinate plane, and reflect them in the axes	Position and direction A4b	Translations
		Reflections

5 Fractions, Decimals and Percentages — Sp

Outcome	Quests	Content
Identify the value of each digit in numbers given to 3 decimal places, multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places	Decimals Sp1a	Three decimal places
		Multiply by 10, 100 and 1,000
		Divide by 10, 100 and 1,000
Multiply 1-digit numbers with up to 2 decimal places by whole numbers	Decimals Sp1b	Multiply decimals by integers
Use written division methods in cases where the answer has up to 2 decimal places	Decimals Sp1c	Divide decimals by integers
		Division to solve problems
		Decimals as fractions
Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$]	Decimals Sp1d	Fractions to decimals
Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.	Percentages Sp2	Fractions to percentages
		Equivalent FDP
		Order FDP
		Percentage of an amount

6 Algebra

Outcome	Quests	Content
Use simple formulae	Algebra Sp3a	Find a rule - one step
		Find a rule - two step
Generate and describe linear number sequences	Algebra Sp3b	Forming expressions
Express missing number problems algebraically	Algebra Sp3c	Substitution
		Formulae
		Forming equations
Find pairs of numbers that satisfy an equation with two unknowns	Algebra Sp3d	Solve simple one-step equations
		Solve two-step equations
Enumerate possibilities of combinations of two variables	Algebra Sp3e	Find pairs of values

7 Measurement

Outcome	Quests	Content
Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3 decimal places	Converting units Sp4a	Metric measures
		Convert metric measures
Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate	Converting units Sp4b	Calculate with metric measures
	Converting units Sp4c	Miles and kilometres
		Imperial measures
Recognise that shapes with the same areas can have different perimeters and vice versa	Perimeter, area and volume Sp5a	Shapes - same area
Recognise when it is possible to use formulae for area and volume of shapes	Perimeter, area and volume Sp5b	Area and perimeter
Calculate the area of parallelograms and triangles	Perimeter, area and volume Sp5c	Area of a triangle (1)
		Area of a triangle (2)
		Area of a triangle (3)
		Area of a parallelogram
Calculate, estimate and compare volume of cubes and cuboids using standard units, including cm^3 , m^3 and extending to other units (mm^3 and km^3).	Perimeter, area and volume Sp5d	Volume - counting cubes
		Volume of a cuboid

8 Ratio and Proportion

Outcome	Quests	Content
Solve problems involving the relative sizes of 2 quantities where missing values can be found by using integer multiplication and division facts	Ratio Sp6a	Using ratio language
		Ratio and fractions
		Introducing the ratio symbol
Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.	Ratio Sp6b	Calculating ratio
Solve problems involving similar shapes where the scale factor is known or can be found	Ratio Sp6c	Using scale factors
		Calculating scale factors
		Ratio and proportion problems

9 Statistics

Outcome	Quests	Content
Interpret and construct pie charts and line graphs and use these to solve problems	Statistics Sp7a	Read and interpret line graphs
		Draw line graphs and solve problems
Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius	Statistics Sp7b	Circles
		Read and interpret pie charts
		Pie charts with percentages
		Draw pie charts
Calculate and interpret the mean as an average	Statistics Sp7c	The mean

10 Geometry – Properties of Shapes

Outcome	Quests	Content
Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.	Properties of shape Su1a	Measure with a protractor
		Introduce angles
		Calculate angles
		Vertically opposite angles
Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons	Properties of shape Su1b	Angles in a triangle
		Angles in a triangle - special cases
		Angles in a triangle - missing angles
		Angles in quadrilaterals
		Angles in regular polygons
Draw 2-D shapes using given dimensions and angles	Properties of shape Su1c	Draw shapes accurately
Recognise, describe and build simple 3D shapes, including making nets	Properties of shape Su1d	Draw nets of 3-D shapes



For more information about Mathletics,
contact our friendly team.

www.mathletics.com/contact



A 3P Learning Product