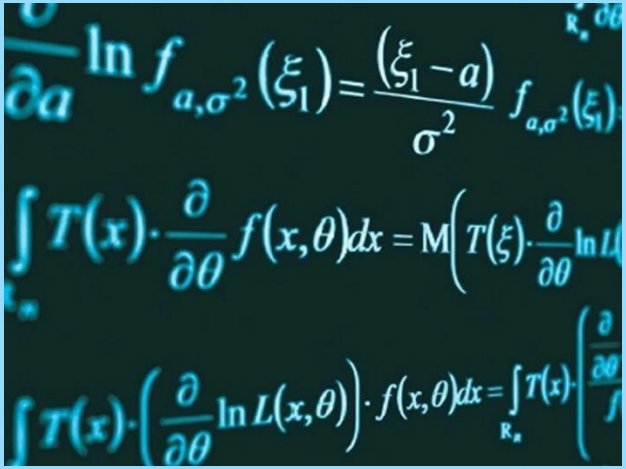
2019

Curriculum Skills and Progression Mathematics



Nebula
where stars are born

The Nebula Federation

White Woman Lane Junior School

Mathematics

Our curriculum intends to produce well-rounded mathematicians by improving children's fluency, reasoning and problem solving.

Fluency: All maths lessons start with a 'Fast 5' activity which contains quick questions revising subject matter already taught (e.g place value and operations) in order to improve children's fluency.

e.g. **0.08 x ? = 80**

2305 – 185.6

18 more than –4

3.5kg = ?g

80 x 70 = ?

Reasoning and Problem Solving: The main content of each lesson will contain 'deeper thinking' or 'challenge' questions that require the children to apply their knowledge in new contexts.

e.g. Y3: Six girls share three bars of chocolate equally. Four boys share two bars of chocolate equally. Does each girl get more chocolate, less chocolate or the same amount of chocolate as each boy? Draw a picture to show that your reasoning is correct.

Y4: A crocodile is 3 times as long as a pig. An elephant is 1·2 m longer than the crocodile. The elephant is 4·2 m long. How long is the pig?

Y5: A 1.5 m piece of ribbon is cut into equal pieces and a piece measuring 6 cm remains. What might the lengths of the equal parts be? In how many different ways can the ribbon be cut into equal pieces?

Y6: Jakob says to Peter, 'Last month I saved 0.5 of my pocket money and this month I saved $1/3$ *of my pocket money, so altogether I've saved 40% of my pocket money'. Do you think Peter should agree with Jakob? Explain your decision.*

No single scheme is used for resources. Examples of sources include Target Your Maths, Abacus, Whiterose Maths, Nrich, NCETM, Testbase, TES and many others.

TTRockstars is used throughout the school to promote and improve times tables fluency.

SKILLS MAP Mathematics – Year 3	
Expected	**Greater Depth**
Pupils can … • Compare and order numbers up to 1000 • Read and write numbers up to 1000 in numerals and words • Count in multiples of 4, 8, 50 and 100 • Find 10 or 100 more or less than a given number • Recognise the place value of each digit in a three digit number (hundreds, tens, ones) • Solve number problems and practical problems involving place value • Add and subtract numbers mentally, including: a 3 digit number and ones, a 3 digit number and tens, a 3 digit number and hundreds • Add and subtract numbers with up to 3 digits using formal written methods of column addition and subtraction – see school calculation policy • Solve problems including missing number problems using number facts, place value and more complex addition and subtraction • Recall and use multiplication and division facts for the 3, 4 and 8 times tables • 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 • 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 • Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators • Recognise and show, using diagrams, equivalent fractions with small denominators • Compare and order unit fractions and fractions with the same denominators	**Pupils can …** • Work in a systematic, logical way to find patterns, generalise and justify mathematical thinking • Reason and represent place value in different ways using mathematical language • Partition a 3-digit number and use that to work out its compliment to 1000, explaining their reasoning using the language of place value • Calculate mentally using efficient strategies • Solve missing numbers problems such as 384 = 171 + ? • Use formal methods to solve problems, including multi-step and apply skills to create own multi-step problems using mathematical language: • Solve problems such as 'A fish weighs 50g, another fish weighs 8 times as much, how much does the larger fish weigh?' • Solve problems such as, 'Dad drives a truck. Last week he drove 267 miles on Monday, 186 on Tuesday and 198 on Wednesday. This week Dad drove 282 miles in total. What is the difference in mileage between this week and last week?' • Recognise relationships between fractions and decimals and express them as equivalent quantities - Jimmy has 6 marbles. This is 0.4 or 2/5s of the total number. What is the total number of marbles? • Calculate using fractions and decimals • Calculate 2/4 + 3/4 = 5/4 and 5/4 – 3/4 = 2/4. They realise that 5/4 is greater than one and can suggest ways to record this • Calculate with measures (time, capacity, length, mass) - 6 toy cars balance 2 dolls. 4 dolls balance 1 toy robot. If the robot weighs 3 kg, what does each toy car weigh? • Use mathematical reasoning to compare angles - Can you draw a quadrilateral with: 1 right angle? 2 right angles? 5 right *angles? No right angles?* Can you draw a triangle with 1 right angle? 2 Right angles? Are some of these are impossible, can you explain why?

• Add and subtract fractions with the same denominator within one whole • Measure, compare, add and subtract: lengths (m/cm/mm): mass (kg/g) volume/capacity (l/ml) including measuring the perimeter of simple 2D shapes • Add and subtract amounts of money to give change using both £ and p in practical contexts • Tell and write the time from an analogue clock, including using Roman numerals from 1 to X11 and 12 hour and 24 hour clocks • Record and compare time in respect to seconds, minutes and hours • Know the number of days in a month, the number of months in a year and the number of days in a year – including a leap year • Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn: identify whether angles are greater than or less than a right angle • Identify horizontal and vertical lines and pairs of perpendicular and parallel lines • Interpret and present data using bar charts, pictograms and tables, including solving one step and 2 step questions using information presented in scales bar charts and pictograms and tables • Draw 2D shapes using mathematical language • Recognise 2D and 3D shapes in different positions and orientation and describe them	
Key Vocabulary: Compare,Add, Subtract, Multiply, Divide, Equal, Place Value, Equivalent fractions, Tenths, Numerator, Denominator, Perimeter, Right angle, Horizontal, Vertical, Bar chart, 2D, 3D	

Medium Term Plan: Y3

Week	*1*	2 3	4	5 6	
Autumn 1	*Place Value* Count from 0 in multiples of 4, 8, 50 and 100 Compare and order numbers up to 1000 Read and write numbers to 1000 in numerals and words Find 10 or 100 more or less than any given number Recognise the place value of each digit in a 3 digit number (H,T,U) Solve number problems and practical problems involving the above		Addition and Subtraction Add and subtract numbers mentally (3 digit and 1's, 3 digit and 10's, 3 digit and 100's) Add numbers with up to 3 digits using formal written methods Subtract numbers with up to 3 digits using formal written methods Estimate and use inverse operations Solve addition and subtraction 2 step problems in contexts (choose methods and explain why)		
Autumn 2	*Number Properties* Recall and use multiplication and division facts for the 3, 4 and 8 times tables Write and calculate mathematical statements for multiplication and division using times tables that they know (including 2 digit x 1 digit)		Multiplication and Division Begin to use formal methods of multiplication and division (based on tables knowledge) Solve problems involving multiplication and division in context (including missing number problems)		

Spring 1	*Properties of fractions and decimals* Count up and down in tenths Recognise tenths arise from dividing a number/object into 10 equal parts Recognise, find and write fractions of a set of objects Recognise and use fractions as numbers Recognise, and show with diagrams, equivalent fractions with small denominators Compare and order fractions with the same denominators Add and subtract fractions with same denominator within one whole (5/7 + 1/7 = 6/7) Solve problems that involve the above	Time Tell and write the time from: analogue clocks (including R.N) 12 hour clocks 24 clocks Estimate and read time to the nearest minute Use vocabulary such as O'clock/a.m/p.m, morning, afternoon, noon and midnight Know the number of seconds in a minute Number of days in each month, year and leap year Compare how long 2 things have taken	
Spring 2	*Properties of Shape* Identify horizontal, vertical lines and pairs of perpendicular and parallel lines Draw 2D shapes Make 3D shapes using modelling materials Recognise 3D shapes and describe them	Angles Recognise that angles are a property of a shape or a description of a turn Identify right angles Recognise 2 right angles make a half turn, three make 3 quarters and four a complete turn Identify whether angles are greater than or less than a right angle	

Summer 1	*Data Handling* Interpret and present data using bar charts, pictograms and tables Solve one and two step problems using info from bar charts, pictograms and tables (How many more? How many fewer?)	Money Add and subtract amounts of money to give change (£ and p in practical contexts)	
Summer 2	Solving problems with measures Compare lengths (m/cm/mm) Compare mass (kg/g) Compare volume (l/ml) Measure lengths (m/cm/mm) Measure mass (kg/g) Measure volume (l/ml) Add and subtract lengths, mass and capacity Measure perimeters of simple 2D shapes		

SKILLS MAP Mathematics – Year 4	
Expected	**Greater Depth**
Pupils can … • Count in multiples of 6, 7, 9, 25 and 1000 • Count backwards through zero to include negative numbers • Order and compare numbers beyond 1000, including up to 2 decimal places • Find a 100 more or less than a given number • Recognise the place value of each digit in a four digit whole number • Round any number to the nearest 10, 100 or 1000 • Read roman numerals up to 100 • Add and subtract numbers up to 4 digit using formal written methods – see school calculation policy • Solve addition and subtraction two step problems in contexts, deciding which operations and methods to use and why • Recall multiplication and division facts of multiplication tables up to 12 x 12 • Multiply 2 and 3 digit numbers by 1 digit number using a formal written layout – see school calculation policy • Recognise and show, using diagrams (e.g fraction walls), common equivalent fractions, including adding and subtracting fractions • Can find fractions of a given quantity • Count up and down in hundredths: recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten, including representing as a decimal • Round decimals with one decimal place to the nearest whole number • Solve simple measure and money problems involving fractions and decimals to two decimal places, including formal column method where appropriate • Convert between different units of measure (kilometre to metre: hour to minute) • Solve problems involving converting time between analogue and digit 12 and 24 hour clocks	**Pupils can …** • Work in a systematic, logical way to find patterns, generalise and justify mathematical thinking. • Reason about place value: *How many different ways can you write 5510. Pupils suggest ways such as 551 tens, 55 hundreds and 1 ten 5510 units* • *Arrange the digit cards 1 4 5 and 8 to make the number closest to 6000 and can justify their choice using the language of place value.* • Calculate mentally using efficient strategies: *Write 3 calculations in which you would use mental calculation strategies and 3 where you would apply a column method and explain the decision you made with each calculation Can work out 345 x 6 mentally by calculating 300 x is 1800 40 x 6 is 240 and 5 x 6 is 30 to get 2070* • Apply formal methods to solve multi-step problems: *Sarah buys 5 pens at £1.25 each, 3 pencils at 38p each and a ruler for 85p. How much change does she get from £10?* • Recognise relationships between fractions and decimals and express them as equivalent quantities: *Can you order these decimals and fractions on a number line? 0.35 3/4 0.5 1/5 4/9* • Calculate using fractions and decimals: *A soup recipe uses 3/4 as many onions as carrots. Jo is making the soup and has 8 carrots. How many onions does Jo use? Explain how you worked out the number of onions? Did you use the same method each time?* • Substitute values into a simple formula to solve problems: *3 x a + 2 = 17 What is the value of a?* • Calculate with measures (time, capacity, length, mass): *Converting and ordering across a range of measures* • Use mathematical reasoning to compare and order angles • Compare angles in order to decide whether a polygon is regular

• Compare and classify geometric shapes, using the language of orientation, including quadrilaterals and triangles, based on their properties and sizes, including Identifying acute, obtuse angles and right angles • Measure and calculate the perimeter and area of rectilinear shapes – including squares in m and cm • Identify lines of symmetry in 2D shapes presented in different orientations • Plot specified points and draw sides to complete a given polygon • Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs • Describe and plot positions on 2D grids as co-ordinates, including describing movements as translation	
Key Vocabulary: Negative numbers, Rounding, Fraction of amounts, Hundredths, Decimals, Quadrilateral, Acute, Obtuse, Area, Symmetry, Coordinate, Translation	

Medium Term Plan: Y4

Week	*1*	2	3	4	5	6	7
Autumn 1	*Place Value* Count in multiples of 6, 7, 9, 25 and 1000 Order and compare numbers beyond 1000 Find 1000 more or less than a given number Recognise the value of each digit in a 4 digit number (Th, H, T, U) Identify, represent and estimate numbers using different representations Read Roman Numerals to 100 Round any number to the nearest 10, 100, 1000 Count backwards through 0 to include negative numbers Solve number and practical problems involving the above with increasingly large numbers		Addition and Subtraction Add and subtract numbers with up to 4 digits using formal written methods Estimate and use inverse operations to check answers to a calculation Solve addition and subtraction 2 step problems in context (choose methods, explain why)		Perimeter Measure and calculate the perimeter of a rectilinear shape (including squares) in cm and m		
Autumn 2	*Number Properties* Recall multiplication and division facts for tables up to 12 x 12 Use place value , known and derived facts to multiply and divide mentally		Multiplication and Division Multiply 2 digit and 3 digit numbers by a 1 digit number using formal written method		Area Find the area of rectilinear shapes by counting squares		

	(including x by 0 and 1; / by 1; multiply 3 numbers) Recognise and use factor pairs and commutativity in mental calculations	Divide 2 digit numbers by 1 digit using tables knowledge and bus stop Solve problems involving multiplication and division		
Spring 1	*Properties of fractions and decimals* Count up and down in hundredths Recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten Round decimals with 1 d.p. to the nearest while number Compare numbers with the same number of d.p. up to 2 d.p. Recognise and show, using diagrams, families of common equivalent fractions (1/2, 2/4, 3/6, 4/8) Find the effect of dividing a 1 or 2 digit number by 10 and 100 (identify value of digits in answer as ones, tenths, hundredths)	Fractions Add and subtract fractions with the same denominator Recognise and write decimal equivalents to ¼, ½, ¾ Recognise and write decimal equivalents of any number of tenths and hundredths Solve problems involving calculating quantities and fractions to divide quantities Solve simple measure and money problems involving fractions and decimals to 2d.p.	Time Read, write and convert time between analogue and digital clocks (12 hour and 24 hour) Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days	
Spring 2	*Properties of Shape* Compare and classify geometric shapes (including quadrilaterals and triangles) based on their properties Identify lines of symmetry in 2D shapes (including in different orientations)	Angles Identify acute, obtuse and reflex angles Compare and order angles by size	Co-ordinates Describe positions on a 2D grid as coordinates in the first quadrant Plot specified points and draw sides to complete a given polygon	

	Complete a simple symmetric figure across a line of symmetry			
Summer 1	*Data Handling* Interpret and present discrete and continuous data using bar charts and time graphs Sole problems using info presented in bar charts, pictograms, tables and other graphs (comparison, sum, difference etc)	Transformations Describe movements between positions as translations of a given unit to the left/right and up/down	Units of measure Convert between different units of measurement (km/m hour/min)	
Summer 2	Solving problems with measures Compare different measures, including money Estimate different measures, including money			

SKILLS MAP Mathematics – Year 5	
Expected	**Greater Depth**
Pupils can … • Read, write, order and compare numbers to at least 1000000 and determine the value of each digit, including up to 3 decimal places • Round any number up to 1000000 to the nearest 10, 100, 100, 10,000 and 100,000, including rounding to the nearest whole number and one decimal place • Interpret negative numbers in context • Count forwards and backwards with positive and negative whole numbers, including through zero • Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) – solve multi-step problems • Add and subtract whole numbers with more than 4 digits mentally • Solve problems involving multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. Including prime numbers, composite numbers, squares and cubes • Solve problems involving multiplication and division, including scaling by simple fractions • Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • Compare and order fractions whose denominators are all multiples of the same number • Read and write decimal numbers as fractions • Recognise fractions and decimal equivalents of percent • Read, write, order and compare numbers with up to three decimal places • Solve problems which require knowing percentage and decimal equivalents of a half, quarter, a fifth, two fifths and four fifths and those fractions with a denominator of a multiple of 10 or 25 • Recognise mixed numbers and improper fractions and convert them from one form to the other • Add and subtract fractions with the same denominators and with denominators with the same multiples	**Pupils can …** • Work in a systematic, logical way to find patterns, generalise and justify mathematical thinking • Reason and represent place value in different ways using mathematical language: *Pupils can work the connection between finding the difference between negative numbers and subtracting them* • Calculate mentally using efficient strategies: *Pupils can write a variety of calculations derived from 15 + 63 = 78 and generalize to describe further calculations 20x 7 x 5 = 20 x 5 x 7 = 100 x 7 = 700* • Use formal methods to solve problems, including multi-step: *Sam and Tom have £67.80 between them. If Sam has £6.20 more than Tom, how much does Tom have?* • Solve problems between fractions and decimals and percentages and express them as equivalent quantities: *Jack and Jill each go out shopping. Jack spends ¼ of his money. Jill spends 20% of her money. Frank says Jack spent more because ¼ is greater than 20%. Alice says you cannot tell who spent more. Who do you agree with, Frank or Alice? Explain why?* • Use the numbers 3 4 5 and 6 makes this sum have the smallest possible answer: *I spent 3/5s of my money and had £1.40 left to buy lunch. How much money did I have to begin with?* • Substitute values into a simple formula to solve problems • Find the perimeter of a rectangle or the area of a triangle: *A rectangle has a perimeter of 20. What is the largest possible area it could have?* • Calculate with measures (time, capacity, length, mass) - *True or false? 1.5kg + 600 g = 2.1kg + 300g 32 cm + 1.05m = 150 cm – 0.13 m 3/4 L + 0.05 L = half of 1.6 L Explain your reasoning* • Apply angle properties in different contexts • Construct a triangle with angles of 48 degrees 60 degrees and 72 degrees and draw any rectilinear shape, with given dimensions, to the nearest millimetre

• Multiply proper fractions and mixed numbers by whole numbers • Convert between different units of metric measure (k/m) (cm/ml) (g/kg) (l/ml) • Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • Calculate and compare the area of rectangles (including squares) and including using standard units, square cm and square m and estimate the area of irregular shapes • Estimate and identify the volume • Draw given angles and measure them in degrees • Distinguish between regular and irregular polygons based on reasoning about equal sides and angles, including finding missing lengths and angles • Identify angles at a point, straight line and a quarter turn • Identify and describe and represent the position of shapes after reflection and translation • Identify 3D shapes from 2D representations • Complete, read and interpret information in tables, including timetables and line graphs-identifying patterns and trends	
Key Vocabulary: Factors, Common factors, Multiples, Prime Numbers, Composite Numbers, Square Numbers, Cube Numbers, Percent, Mixed Number, Improper Fraction, Volume, Regular and Irregular, Reflection, Translation, Line graphs	

Medium Term Plan: Y5

Week	1	2	3	4	5	6	7
Autumn 1	*Place Value* *Count forward or backward in powes of 10 for any number (up to 1000000)* *Know value of each digit up to 1,000,000* *Read, write, order and compare numbers to at least 1,000,000* *Rounding (10, 100, 1000, 10000, 100,000)* *Negative number counting* *(Solve practical number problems involving the above)*		Addition and Subtraction Commutativity Add and subtract numbers mentally Column addition (4+ digits) Column subtraction (4+ digits) Solve multi-step addition and subtraction problems (choose methods and explain why)		Perimeter Measure and calculate perimeter of composite rectilinear shapes		
Autumn 2	*Number Properties* *Know and use vocabulary of: Prime numbers, prime factors and composite numbers* *Recognise and use: Square numbers and cube numbers (including notation)* *Identify multiples and factors (Including common factors)*		Multiplication and Division Multiply and divide numbers mentally drawing upon know facts Multiply using a written method (Up to digits: 4 x 2) Divide numbers using written method (Up to 4 digits / 1 digit) Solve problems involving multiplication and division (including simple scaling)		Area Calculating and compare the area of rectangles (cm2, m2) Estimate the area of irregular shapes Estimate volume (1cm3 blocks) and capacity (water)		

	Multiply and divide by 10, 100, 1000 including decimals *Read Roman Numerals up to 1000*	Solve problems involving a combination of all 4 operations (including understanding meaning of = sign)		
Spring 1	*Properties of fractions and decimals* *Recognise and use tenths, hundredths and thousandths* *Round decimals with 2d.p. to nearest whole number/1 d.p.* *Read, write, order and compare numbers with up to 3 d.p.* *Read and write decimal numbers as fractions (0.71=71/100)* *Identify and write equivalent fractions* *Cancel fractions* *Solve problems involving numbers up to 3 d.p.*	Fractions Add and subtract fractions with the same denominator and denominators that are multiples of the same number Compare and order fractions (whose denominators are multiples of same number) Recognise mixed numbers and improper fractions and convert from one to the other Write statements >1 as a mixed number (e.g. 2/5 + 4/5 = 6/5 = 1 1/5) Multiply proper fractions and mixed numbers by whole numbers (use diagrams to help) Find fractions of amounts	Percentage Recognise the % symbol Understand it relates to 'number of parts per 100' Write % as a fraction and as a decimal Solve problem which require knowing % and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5 and fractions with denominators of 10 or 25	
Spring 2	*Properties of Shape* *Use properties of rectangles to identify missing length/angles* *Identify regular and irregular polygons* *Properties of 2D shapes* *Properties of 3D shapes*	Angles Estimate and compare acute, obtuse and reflex angles in degrees Draw given angles and measure in degrees Identify: Angles in a triangle (180)	Co-ordinates Identify and plot co-ordinates Plot specified points to complete polygons	

		Angles on straight line (180) Angles round a point (360)		
Summer 1	*Data Handling* *Complete, read and interpret info from tables (including timetables)* *Solve problems using information from a bar chart, pictogram or line graph*	Transformations Identify, describe and represent the position of a shape following a reflections or a translation	Units of measure Convert between different metric units of measure Understand and use approx. equivalences between metric and imperial (inches, pounds, pints)	
Summer 2	Solving problems with measures *Use all four operations to solve problems involving money (including scaling)* *Use all four operations to solve problems involving length (including scaling)* *Use all four operations to solve problems involving mass (including scaling)* *Use all four operations to solve problems involving volume (including scaling)*	Time Solve problems converting between units of time	Sequences Recognise and describe number sequences (including fractions and decimals) Identify term to term rule in the sequence	

SKILLS MAP Mathematics – Year 6	
Expected	**Greater Depth**
Pupils can … • Demonstrate an understanding of place value, including large numbers and decimals (e.g. what is the value of the '7' in 276,541?; find the difference between the largest and smallest whole numbers that can be made from using three digits; 8.09 = 8 + 9 ?; 28.13 = 28 + + 0.03) • Round any whole numbers to a given degree of accuracy • Use negative numbers in context including calculating intervals across zero • Perform mental calculations including mixed operations and large numbers, using efficient strategies such as manipulating expressions using commutative and distributive properties to simplify the calculation *(e.g. 53 – 82 + 47 = 53 + 47 – 82 = 100 – 82 = 18; 20 × 7 × 5 = 20 × 5 × 7 = 100 × 7 = 700; 53 ÷ 7 + 3 ÷ 7 = (53 +3) ÷ 7 = 56 ÷ 7 = 8)* • Use formal methods to solve multi-step problems *(e.g. find the change from £20 for three items that cost £1.24, £7.92 and £2.55; a roll of material is 6m long: how much is left when 5 pieces of 1.15m are cut from the roll?; a bottle of drink is 1.5 litres, how many cups of 175ml can be filled from the bottle, and how much drink is left?) Follow calculation policy* • Use knowledge of the order of operations to carry out calculation using the four operations (BODMAS) • Recognise the relationship between fractions, decimals and percentages and can express them as equivalent quantities (e.g. one piece of cake that has been cut into 5 equal slices can be expressed as 1 5 or 0.2 or 20% of the whole cake) • Express a remainder as a decimal or fraction • Add and subtract fractions with different denominations and mixed numbers	**Pupils can …** • Work in a systematic, logical way to find patterns, generalise and justify mathematical thinking • Have sufficient depth of knowledge and understanding to reason and explain mathematical concepts and procedures and use them to solve a variety of problems, using mathematical language

• Multiply pairs of proper fractions and divide fractions by whole numbers • Use common factors to simplify fractions, compare and order fractions including fractions greater than one • Calculate using fractions, decimals or percentages *(e.g. knowing that 7 divided by 21 is the same as 7 21 and that this is equal to 1 3; 15% of 60; 11 2 + 3 4; 7 9 of 108; 0.8 x 70).* • Substitute values into a simple formula to solve problems *(e.g. perimeter of a rectangle or area of a triangle).* • Generate and describe linear number sequences • Express missing number problems algebraically • Find pairs of numbers that satisfies an equations with 2 unknown • Enumerate possibilities of combinations of 2 variables • Calculate with measures (e.g. calculate length of a bus journey given start and end times; convert 0.05km into m and then into cm). • Convert between miles and km • Calculate and compare volumes of cubes and cuboids • Solve problems involving ratio and scale factor • Reason why shapes with the same area can have different perimeters (and vice versa) • Calculate areas of parallelograms and triangles	
Key Vocabulary: Order of operations, BODMAS, Formula, Value, Algebra, Expression, Equation, Ratio, Scale Factor	

Medium Term Plan: Y6

Week	*1*	2	3	4	5	6	7
Autumn 1	*Place Value* Read, write, order and compare number up to 10,000,000 Determine the value of each digit in numbers up to 10,000,000 Round any whole number to required degree of accuracy Use negative numbers in context, calculate across zero Solve number and practical problems involving the above		Addition and Subtraction Solve addition and subtraction multi-step problems in contexts (decide which operations/methods to use and why)		Algebra Express missing number problems algebraically Use simple formulae Generate and describe linear number sequences Find pairs of numbers that satisfy an equation with 2 unknowns Enumerate possibilities of combinations of 2 variables		
Autumn 2	*Number Properties* Identify common factors, common multiples and prime numbers Perform mental calculations, including with mixed operations and large numbers		Multiplication and Division Multiply numbers using formal written method (Up to 4 digit x 2 digit) Multiply 1 digit numbers with up to 2 d.p. by whole numbers Divide numbers using formal written method (up to 4 digit by 2 digit) and interpret remainders as appropriate for context (whole, fraction, rounding) Use written division for answers with up to 2 d.p		Area and Volume Recognise shapes with the same area can have different perimeters and vice versa Calculate the area of parallelograms and triangles Recognise when it is possible to use formulae for the area of shapes Calculate, estimate and compare volume of cubes and cuboids (cm3/m3/km3)		

		Solve problems involving addition, subtraction, multiplication and division using knowledge of order of operations	Recognise when it is possible to use the formulae for the volume of shapes	
Spring 1	*Properties of fractions and decimals* Use common factors to simplify equivalent fractions Use common multiples to express fractions in the same denomination Compare and order fractions (including fractions >1) Identify the value of each digit to 3 d.p. Multiply and divide by 10, 100, 1000 giving answer to 3 d.p.	Fractions and Percentage Add and subtract fractions with different denominators and mixed numbers (using concept of equivalent fractions) Multiply simple pairs of proper fractions writing answer in simplest form (1/4 x ½ = 1/8) Divide proper fractions by whole numbers (1/3 / 2 = 6) Associate a fraction with division to calculate decimal fraction equivalents (0.375 = 3/8) Recall and use equivalences between simple fractions, decimals and percentages (including in different contexts)	Ratio and Proportion Solve problems involving the relative size of 2 quantities (missing values found using x and / facts) Solve problems involving the calculation of percentages Solve problems involving similar shapes where scale factor is known or can be found Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples	
Spring 2	*Properties of Shape* Compare and classify geometric shapes based on their properties and sizes Describe simple 3D shapes Draw 2D shapes given dimensions and angles Recognise and build simple 3D shapes, including making nets	Angles Find unknown angles in any triangles, quadrilaterals and regular polygons Recognise angles where they meet at a point, are on a straight line, or are vertically opposite and find missing angles	Co-ordinates and transformations Draw and translate simple shapes on the coordinate plane, and reflect them in the axes Describe positions on full coordinate grid (all 4 quadrants)	

	Name parts of circles, including radius, diameter and circumference Know diameter is twice the radius			
Summer 1	*Data Handling* Interpret and construct pie charts and line graphs and use these to solve problems Calculate and interpret the mean as an average	Solving problems with measures Use read, write and convert between standard units (length, mass, volume and time)from smaller unit to larger and vice versa (up to 3d.p.) Convert between miles and km Solve problems involving the conversion of measure (up to 3d.p.)		