Maths Curriculum

Thompson Primary School

How we teach mathematics at Thompson Primary School

At Thompson Primary School, we use White Rose Maths as the basis of our maths teaching, with teachers adapting the resources and planning according to the needs of their learners. The daily maths lesson should last approximately 45 minutes in KS1 and 60 minutes in KS2. In addition, all classes in KS1 and KS2 will deliver interactive daily Fluency Sessions of approximately 15 minutes long. These sessions will focus on fluency practice and reinforcing prior learning and key objectives which have already been taught. 'Fluent in Five' will be delivered in daily morning starter sessions, to help children develop and maintain fluency in both written and mental calculations.

Lessons are sharply focused with one new objective introduced at a time.

Difficult points and potential misconceptions are identified in advance and strategies to address them planned. Key questions are planned, to challenge thinking and develop learning for all pupils.

Teaching sequences will involve review of prior learning, teacher input and teacher-led discussion interspersed with short tasks involving pupil-to-pupil discussion, independent work and challenges. Independent practice includes fluency practice, reasoning, problem solving and higher-order thinking activities.

The use of high-quality mastery materials and tasks to support learning and to provide access to the mathematics is integrated into lessons.

A variety of resources are used to aid children's learning and to build knowledge and competency:
Concrete – using concrete manipulatives to help understanding,
Pictorial – building upon concrete through pictorial representations which can be used to reason and solve problems
Abstract – using the previous foundations to develop an abstract approach of using numbers and concepts with confidence.

In the Foundation Stage, children are given the opportunity to develop their understanding of counting, number and numerical patterns through a combination of short, formal teaching sessions as well as a range of planned purposeful play situations.

In mathematics it is crucial to incorporate precise mathematical language into every lesson. Through weekly planning, teachers plan the key vocabulary to be learnt to ensure a secure understanding throughout the topic. Key vocabulary is also implemented through stem sentences to effectively structure learning and understanding. Vocabulary is discussed throughout lessons and is used when recapping prior learning from previous topics. Teachers will use and display this vocabulary during teaching and on Maths working walls to encourage children to use the mathematical language accurately. The working walls consolidate and reinforce children's knowledge and aid their learning further. These are updated regularly to adhere to the current topic and are consistent across the whole school. The working walls also display the learning objective, examples of work, reasoning and problem-solving questions and a numeracy for life challenges which provides examples of how the topic can be applied to real life.

Robins – Sequence of learning and small steps covered

Autumn Term		**Spring Term**		**Summer Term**	
Year 1 Small Steps	**Year 2 Small Steps**	**Year 1 Small Steps**	**Year 2 Small Steps**	**Year 1 Small Steps**	**Year 2 Small Steps**
Place Value (within 10) Sort objects Count objects Count objects from a larger group Represent objects Recognise numbers as words Count on from any number 1 more Count backwards within 10 1 less Compare groups by matching Fewer, more, same Less than, greater than, equal to Compare numbers Order objects and numbers The number line Addition and Subtraction Introduce parts and wholes Part-whole model Write number sentences Fact families – addition facts Number bonds within 10 Systematic number bonds within 10 Number bonds to 10 Addition – add together Addition – add more Addition problems Find a part Subtraction – find a part	Place Value Numbers to 20 Count objects to 100 by making 10s Recognise tens and ones Use a place value chart Partition numbers to 100 Write numbers to 100 in words Flexibly partition numbers to 100 Write numbers to 100 in expanded form 10s on the number line to 100 10s and 1s on the number line to 100 Estimate numbers on a number line Compare objects Compare numbers Order objects and numbers Count in 2s, 5s and 10s Count in 3s Addition and Subtraction Bonds to 10 Fact families – addition and subtraction bonds within 20 Related facts Bonds to 100 (tens) Add and subtract 1s Add by making 10 Add three 1-digit numbers Add to the next 10 Add across a 10	Place Value Count within 20 Understand 10 Understand 11, 12, 13 Understand 14, 15, 16 Understand 17, 18, 19 Understand 20 1 more and 1 less to 20 Understand the number line to 20 Use a number line to 20 Estimate on a number line to 20 Compare numbers to 20 Order numbers to 20 Count from 20 to 50 Understand 20, 30, 40 and 50 Count by making groups of 10 Understand groups of tens and ones Partition into tens and ones Use a number line to 50 Estimate on a number line to 50 1 more and 1 less up to 50 Addition and Subtraction Add by counting on within 20 Add ones using number bonds Find and make number bonds to 20 Use doubles	Multiplication and Division Recognise equal groups Make equal groups Add equal groups Understand the multiplication symbol Create multiplication sentences Use arrays Make equal groups - grouping Make equal groups – sharing Know the 2 times table Divide by 2 Double and halve Know odd and even numbers Know the 10 times table Divide by 10 Know the 5 times table Divide by 5 Use the 5 and 10 times tables to solve problems Height and Length Measure in centimetres Measure in metres Compare length and height Order lengths and heights Use the four operations with lengths and heights Money Count money in pence Count money in pounds (notes and coins)	Multiplication and Division Count in 2s Count in 10s Count in 5s Recognise equal groups Add equal groups Make arrays Make doubles Make equal groups – grouping Make equal groups – sharing Fractions Recognise a half of an object or a shape Find a half of an object or a shape Recognise a half of a quantity Find a half of a quantity Recognise a quarter of an object or a shape Find a quarter of an object or a shape Recognise a quarter of a quantity Find a quarter of a quantity Geometry – position and direction Describe turns Describe position – left and right Describe position – forwards and backwards Describe position – above and below	Fractions Understand parts and wholes Understand equal and unequal parts Recognise a half Find a half Recognise a quarter Find a quarter Recognise a third Find a third Find the whole Understand unit fractions Understand non-unit fractions Recognise the equivalent of a half and two quarters Recognise three-quarters Find three-quarters Count in fractions up to a whole Time Understand and use O'clock and half past Understand and use quarter past and quarter to Tell time past the hour Tell time to the hour Tell the time to 5 minutes Know how many minutes are in an hour Know how many hours are in a day Statistics Make tally charts Read and use tables

Fact families – the eight facts Subtraction – take away/cross out (how many left?) Subtraction – take away (how many left?) Subtraction on a number line Add or subtract 1 or 2 <u>Geometry (Shape)</u> Recognise and name 3D shapes Sort 3D shapes Recognise and name 2D shapes Sort 2D shapes Patterns with 2D and 3D shapes	Subtract across 10 Subtract from a 10 Subtract a 1-digit number from a 2-digt number 10 more, 10 less Add and subtract 10s Add two 2-digit numbers (not across 10) Add two 2-digit numbers (across a 10 Subtract two 2-digit numbers (not across 10) Subtract two 2-digit numbers (across a 10 Mixed addition and subtraction Compare number sentences Missing number problems <u>Shape</u> Recognise 2-D and 3-D shapes Count sides on 2D shapes Count vertices on 2D shapes Draw 2D shapes Lines of symmetry on shapes Use lines of symmetry to complete shapes Sort 2D shapes Count faces on 3D shapes Count edges on 3D shapes Count vertices on 3D shapes Sort 3D shapes Make patterns with 2D and 3D shapes	Use near doubles Subtract ones using number bonds Subtract by counting back Subtract by finding the difference Use related subtraction facts Solve missing number problems <u>Length and Height</u> Compare lengths and heights Measure length using objects Measure length in centimetres <u>Mass and Volume</u> Understand the concept of heavier and lighter Measure mass Compare mass Understand the concept of full and empty Compare volume Measure capacity Compare capacity	Choose notes and coins as appropriate Compare amounts of money Calculate with money Make a pound Find change Solve two-step problems using money <u>Mass, Capacity and Temperature</u> Compare mass Measure in grams Measure in kilograms Use the four operations with mass Compare volume and capacity Measure in millilitres Measure in litres Use the four operations with volume Understand temperature	Identify and use ordinal numbers <u>Place value (within 100)</u> Count from 50 to 100 Count in tens to 100 Partition into tens and ones Use and label a number line to 100 Find 1 more and 1 less Compare numbers with the same about of tens Compare any two numbers <u>Money</u> Unitise Recognise coins Recognise notes Count in coins <u>Time</u> Understand the concept of before and after Understand and use the days of the week Understand and use the months of the year Understand and use hours, minutes and seconds Tell the time to the hour Tell the time to the half hour	Use block diagrams Draw pictograms (1-1) Interpret pictograms (1-1) Draw pictograms (2,5 and 10) Interpret pictograms (2,5 and 10) Position and direction Understand and use the language of position Describe movement Describe turns Describe movement Describe turns Complete shape patterns with turns

Ready to progress criteria for Year 1 – the children should be able to do these things by the end of each unit/whole term. If this is not the case, intervention should be put in place to ensure these specific gaps are filled.

Autumn	Spring	Summer
Number: Place Value (within 10) • count to 10, forwards and backwards, beginning with 0 or 1, or from any given number • count, read and write numbers to 10 in numerals and words. • identify and represent numbers using objects and pictorial representations including the number line, & use language of: equal to, more than, less than (fewer), most, least,< and > • given a number, identify one more and one less • Reason about the location of numbers to 10 within the linear number system, including comparing using < > and = **Number: Addition and Subtraction (within 10)** • Compose numbers to 10, from 2 parts and partition numbers to 10 into parts, including recognising odd and even numbers • Read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs • represent and use number bonds to 10 and related subtraction facts **Number: Addition and Subtraction (within 10)** • Develop fluency in addition and subtraction facts within 10	**Number: Place Value (within 20)** • Reason about the location of numbers to 20 within the linear number system, including comparing using < > and = • count to 20, forwards and backwards, beginning with 0 or 1, or from any given number • read and write numbers from 1 to 20 in numerals and words • given a number, identify one more and one less **Number: Addition and Subtraction (within 20)** • add and subtract one-digit and two-digit numbers to 20, including zero • read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ – 9**.** **Number: Place Value (within 50)** • count to 50, forwards and backwards, beginning with 0 or 1, or from any given number • count, read and write numbers to 50 in numerals. • given a number, identify one more and one less • count in multiples of twos, fives. **Measurement: Length, Height, Weight and Volume**	**Number: Multiplication and Division** • count in multiples of tens • solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher • identify and represent numbers using objects and pictorial representations including the number line **Number: Fractions** • recognise, find and name a half as one of two equal parts of an object, shape or quantity • recognise, find and name a quarter as one of four equal parts of an object, shape or quantity **Geometry: Position and direction** • describe position, direction and movement, including whole, half, quarter and three-quarter turns **Number: Place Value (within 100)** • Counting forwards and backwards within 100 • count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number • count, read and write numbers to 100 in numerals; **Measurement: Money** • recognise and know the value of different denominations of coins and notes **Measurement: Time**

• Compose numbers to 10, from 2 parts and partition numbers to 10 into parts, including recognising odd and even numbers • Read, write and interpret equations containing addition (+), subtraction (-) and equals (=) symbols, and relate additive expressions and equations to real-life contexts • identify and represent numbers using objects and pictorial representations including the number line, & use language of: equal to, more than, less than (fewer), most, least • given a number, identify one more and one less **<u>Geometry - Shape</u>** • recognise and name common 2-D shapes (e.g. Square, circle, triangle) • recognise and name common 3-D shapes (e.g. Cubes, cuboids, pyramids & spheres) • Compose 2D and 3D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations.	• compare, describe and solve practical problems for: length/height, weight/mass, capacity/volume & time • measure and begin to record length/height, weight/mass, capacity/volume & time	• sequence events in chronological order using language • recognise and use language relating to dates, including days of the week, weeks, months and years • tell the time to the hour and half past the hour and draw the hands on a clock face to show these times

Ready to progress criteria for Year 2 – the children should be able to do these things by the end of each unit/whole term. If this is not the case, intervention should be put in place to ensure these specific gaps are filled.

Autumn	Spring	Summer
Number-Place Value •count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward •read and write numbers to at least 100 in numerals and in words • Recognise the place value of each digit in a two-digit number (tens, ones) Compose and decompose 2-digit numbers, using standard and non-standard partitioning •identify, represent and estimate numbers using different representations, including the number line •Reason about the location of any 2-digit number on the linear system, including identifying the previous and next multiple of 10 •compare and order numbers from 0 up to 100; use and = signs •use place value and number facts to solve problems **Number-Addition and Subtraction** • recall and use addition and subtraction facts to 20 fluently, • Recognise the subtraction structure of 'difference' and answer questions of the form, How many more…? •recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. •Derive and use related facts to 100 •add and subtract numbers using concrete objects, pictorial representations, and mentally, including TU+U, TU+T, TU+TU •show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot **Number --Addition and Subtraction**	**Measurement - Money** •recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value •find different combinations of coins that equal the same amounts of money •solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change **Number-Multiplication and Division** •Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2, 5 and 10 multiplication tables. •show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot •Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotative division). •calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs •recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers •solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts **Measurement-Length and Height**	**Statistics** •interpret and construct simple pictograms, tally charts, block diagrams and simple tables •ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity •ask and answer questions about totalling and comparing categorical data **Number-Fractions** •recognise, find, name and write fractions 1/3, 1/4, 2/4 and 3/4 of a length, shape, set of objects or quantity •write simple fractions for example, 1/2 of 6 = 3 and recognise the equivalence of 2/4 and 1/2. **Geometry-Position and Direction** •order and arrange combinations of mathematical objects in patterns and sequences. •use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and ¾ turns **Measurement-Time, Mass, Capacity and Temperature** •compare and sequence intervals of time •tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times •know the number of minutes in an hour and the number of hours in a day **Problem Solving** Continuous Objectives

•Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract only ones or only tens to/from a two-digit number. • Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract any 2 two-digit numbers •solve problems with addition and subtraction, using concrete, pictorial and abstract representations including TU+U, TU+T, TU+TU and U+U+U •recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. **Geometry-Properties of Shape** •identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line. •compare and sort common 2-D and 3-D shapes and everyday objects. •identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces •identify 2-D shapes on the surface of 3-D shapes •compare shapes by reasoning about similarities and differences in properties. •sort common 2-D and 3-D shapes and everyday objects.	•choose and use appropriate standard units to estimate and measure length/height (m/cm to the nearest appropriate unit, using rulers, •compare and order lengths and record the results using >, < and = **Measurement-Mass, Capacity and Temperature** •choose and use appropriate standard units to estimate and measure mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using scales, thermometers and measuring vessels •compare and order mass, volume/capacity and record the results using >, < and =	

Continuous objectives that should be included in all teaching throughout the year – particularly through regular problem solving and reasoning.

- count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
- given a number, identify one more and one less
- identify and represent numbers using objects and pictorial representations including the number line, & use language of: equal to, more than, less than (fewer), most, least
- solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ – 9.
- solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.
- recognise, find and name a half as one of two equal parts of an object, shape or quantity
- recognise, find and name a quarter as one of four equal parts of an object, shape or quantity
- recognise and know the value of different denominations of coins and notes

- use place value and number facts to solve problems
- solve problems with addition and subtraction, using concrete, pictorial and abstract representations
- recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts
- recognise, find, name and write fractions 1/3, 1/4 , 2/4 and 3/4 of a length, shape, set of objects or quantity
- write simple fractions for example, 1/2 of 6 = 3 and recognise the equivalence of 2/4 and 1/2.

Key Basic Skills – these should be the focus of daily retrieval practice. This could be through starters or separate activities throughout the day

Count to and across 100, forwards and backwards, beginning with 0 or 1,
Count, read and write numbers to 100 in numerals
Count in multiples of twos, fives and tens
Identify one more and one less than any given number
Identify and represent numbers using objects pictorial representations
Read and write numbers from 1 to 20 in numerals and words
Memorise and reason with number bonds to 10 and 20
Understand the effect of adding and subtracting zero
Explore inverse relationship between addition and subtraction and use this to derive new facts
Use knowledge of inverse to derive associated addition and subtraction facts and check answers
Solve missing number addition and subtraction problems
Find doubles and halves of numbers and relate to multiplying and dividing by two
Recognise, find and name a half and quarter of objects, shapes or quantities
Recognise and know the value of different denominations of coins and notes
Tell the time to the hour and half past the hour
Recognise and name common 2-D and 3-D shapes

Count across 100, forwards and backwards, in steps of 2, 3, and 5 from 0 and in tens from any number
Read and write numbers to at least 100 in numerals and in words
Recognise the place value of each digit in a two-digit number (tens, ones)
Find 10 more and 1 less than a given number
Recognise zero as a place holder
Compare and order numbers from 0 up to 100; use <, > and = signs
Partition numbers in different ways
Round numbers to the nearest 10 and use this for estimation and calculation purposes
Recall addition and subtraction facts to 20 and derive and use related facts up to 100
Explore inverse relationship between addition and subtraction and use this to derive new facts and to check answers
Double any number between 1 and 30 and find all corresponding halves
Add and subtract numbers mentally using the appropriate strategies and jottings
Solve missing number addition and subtraction problems
Solve missing number problems with multiplication and division
Recognise, name and count and state different amounts of fractions eg ½, 1/3, ¼, 2/4, 3/4
Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times
Find different combinations of coins to make a particular values
Know relationships and simple equivalents between given units for length, mass, and capacity.

Identify and describe the properties of 2-D and 3-D shapes
Identify angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)

Skylarks – Sequence of learning and small steps covered

Autumn Term		Spring Term		Summer Term	
Year 3 Small Steps	**Year 4 Small Steps**	**Year 3 Small Steps**	**Year 4 Small Steps**	**Year 3 Small Steps**	**Year 4 Small Steps**
Place Value Represent numbers to 100 Partition numbers to 100 Number line to 100 Hundreds Represent numbers to 1,000 Partition numbers to 1,000 Flexible partitioning of numbers to 1,000 Hundreds, tens and ones Find 1, 10 or 100 more or less Number line to 1,000 Estimate on a number line to 1,000 Compare numbers to 1,000 Order numbers to 1,000 Count in 50s Addition and Subtraction Apply number bonds within 10 Add and subtract 1s Add and subtract 10s Add and subtract 100s Spot the pattern Add 1s across a 10	Place Value Represent numbers to 1,000 Partition numbers to 1,000 Number line to 1,000 Thousands Represent numbers to 10,000 Partition numbers to 10,000 Flexible partitioning of numbers to 10,000 Find 1, 10, 100, 1,000 more or less Number line to 10,000 Estimate on a number line to 10,000 Compare numbers to 10,000 Order numbers to 10,000 Roman numerals Round to the nearest 10	Multiplication and Division Work with multiples of 10 Carry out calculations related to multiples of 10 Reason about multiplication Multiply a 2-digit number by a 1-digit number (no exchange) Multiply a 2-digit number by a 1-digit number (with exchange) Link multiplication and division Divide a 2-digit number by a 1-digit number (no exchange) Divide a 2-digit number by a 1-digit number (flexible partitioning) Divide a 2-digit number by a 1-digit number (with remainders) Understand multiplication as scaling (e.g., 3 times as many) Understand correspondence problems (e.g., If there are three buckets and four spades, children can explore how many different combinations of bucket and spade they can make.) Length and Perimeter Measure in metres and centimetres	Multiplication and Division Find factor pairs Use factor pairs Multiply by 10 Multiply by 100 Divide by 10 Divide by 100 Use related facts for multiplication and division Use informal written methods for multiplication Multiply a 2-digit number by a 1-digit number Multiply a 3-digit number by a 1-digit number Divide a 2-digit number by a 1-digit number Divide a 3-digit number by a 1-digit number Solve correspondence problems Use efficient methods for multiplication Length and Perimeter Measure in kilometres and metres Find equivalent lengths (kilometres and metres) Calculate perimeter on a grid Find the perimeter of a rectangle Find the perimeter of rectilinear shapes	Fractions Add fractions Subtract fractions Partition the whole Find unit fractions of a set of objects Find non-unit fractions of a set of objects Reason with fractions of an amount Money Understand and use pounds and pence Convert between pounds and pence Add money Subtract money Find change Time Identify and use Roman Numerals to 12 Tell the time to 5 minutes Tell the time to the nearest minute Read the time on a digital clock Use a.m. and p.m. Know the difference between years, months and days and convert between them Convert between days and hours Calculate start and end times with hours and minutes	Decimals Make a whole with tenths Make a whole with hundredths Partition decimals Flexibly partition decimals Compare decimals Order decimals Round to the nearest whole number Show halves and quarters as decimals Money Write money using decimals Convert between pounds and pence Compare amounts of money Estimate with money Calculate with money Solve problems with money Time Convert between years, months, week and days Convert between hours, minutes and seconds Convert between analogue and digital times Convert to the 24 hour clock Convert from the 24 hour clock Shape Understand angles as turns Identify angles Compare and order angles Identify types of triangles

Add 10s across a 100 Subtract 1s across a 10 Subtract 10s across a 100 Make connections Add two numbers (no exchange) Subtract two numbers (no exchange) Add two numbers (across a 10) Add two numbers (across a 100) Subtract two numbers (across a 10) Subtract two numbers (across a 100) Add 2-digit and 3-digit numbers Subtract a 2-digit number from a 3-digit number Complements to 100 Estimate answers Inverse operations	Round to the nearest 100 Round to the nearest 1,000 Round to the nearest 10, 100 or 1,000 <u>Addition and Subtraction</u> Add and subtract 1s, 10s, 100s and 1,000s Add up to 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 numbers - more than one exchange Efficient subtraction Estimate answers	Measure in centimetres and millimetres Find equivalent lengths (metres and centimetres) Find equivalent lengths (centimetres and millimetres) Compare lengths Add lengths Subtract lengths Understand what perimeter is Measure perimeter Calculate perimeter <u>Fractions</u> Understand the denominators of unit fractions Compare and order unit fractions Understand the numerators of non-unit fractions Understand the whole Compare and order non-unit fractions Work with fractions and scales Place fractions on a number line Count in fractions on a number line Find equivalent fractions on a number line Represent equivalent fractions as bar models <u>Mass and Capacity</u> Use scales Measure mass in grams	Find missing lengths in rectilinear shapes Calculate the perimeter of rectilinear shapes Find the perimeter of regular polygons Find the perimeter of polygons <u>Fractions</u> Understand the whole Count beyond 1 Partition a mixed number Use mixed numbers on a number line Compare and order mixed numbers Understand improper fractions Convert mixed numbers to improper fractions Convert improper fractions to mixed numbers Find equivalent fractions on a number line Find equivalent fraction families Add two or more fractions Add fractions and mixed numbers Subtract two fractions Subtract from whole amounts Subtract from mixed numbers <u>Decimals</u> Represent tenths as fractions	Calculate durations using hours and minutes Convert between minutes and seconds Solve problems with time <u>Shape</u> Calculate turns and angles Identify and measure right angles Compare angles Measure and draw angles accurately Know the difference between horizontal and vertical Know the difference between parallel and perpendicular Recognise and describe 2D shapes Draw polygons Recognise and describe 3D shapes Make 3D shapes <u>Statistics</u> Interpret pictograms Draw pictograms Interpret bar charts Draw bar charts Collect and represent data Read and interpret two-way tables	Identify types of quadrilaterals Identify types of polygons Identify lines of symmetry Complete a symmetric figure <u>Statistics</u> Interpret charts Understand and use: comparison, sum and difference Interpret line graphs Draw line graphs Position and direction Describe position using coordinates Plot coordinates Draw 2D shapes on a grid Translate on a grid Describe translation on a grid

Make decisions <u>Multiplication and Division</u> Multiplication - equal groups Use arrays Multiples of 2 Multiples of 5 and 10 Sharing and grouping Multiply by 3 Divide by 3 The 3 times-table Multiply by 4 Divide by 4 The 4 times-table Multiply by 8 Divide by 8 The 8 times-table The 2, 4 and 8 times-tables	Checking strategies <u>Measurement – Area</u> What is area? Count squares Make shapes Compare areas <u>Multiplication and Division</u> Multiples of 3 Multiply and divide by 6 6 times-table and division facts Multiply and divide by 9 9 times-table and division facts The 3, 6 and 9 times-tables Multiply and divide by 7 7 times-table and division facts	Measure mass in kilograms Find equivalent masses in grams and kilograms Compare mass Add and subtract mass Measure capacity and volume in millilitres Measure capacity and volume in litres Find equivalent capacities and volumes (litres and millilitres) Compare capacity and volume Add and subtract capacity and volume	Represent tenths as decimals Represent tenths on a place value chart Represent tenths on a number line Divide a 1-digit number by 10 Divide a 2-digit number by 10 Represent hundredths as fractions Represent hundredths as decimals Represent hundredths on a place value chart Divide a 1- or 2-digit number by 100		

	11 times-table and division facts 12 times-table and division facts Multiply by 1 and 0 Divide a number by 1 and itself Multiply three numbers				

Ready to progress criteria for Year 3 – the children should be able to do these things by the end of each unit/whole term. If this is not the case, intervention should be put in place to ensure these specific gaps are filled.

Autumn	Spring	Summer
Number – Place Value •Know that 10 tens are equivalent to 100 and 100 is 10 x bigger than 10. Identify and work out how many 10's there are in other 3 digit multiples of 10 •recognise the place value of each digit in a three-digit number •compare and order numbers up to 1000 •identify, represent and estimate numbers using different representations •Reason about the location of any 3 digit number in the linear number system, including identifying the previous and next multiple of 100 and 10 •read and write numbers up to 1000 in numerals and in words •count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number. •Divide 100 into 2, 4, 5 and 10 equal parts and read scales/number lines marked in multiples of 100's and 1000's with 2, 4, 5 and 10 equal parts **Number – Addition and Subtraction** • Calculate complements to 100 •add and subtract numbers mentally, including: HTU+U, HTU+T and HTU+H •Estimate the answer to a calculation and use inverse operations to check answers •Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction •Understand the inverse relationship between addition and subtraction and how both relate to the part-part-whole structure. Understand the commutative property of addition and understand the related property of subtraction	**Number – Multiplication and Division** •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, and division of 2 digit numbers by 1 digit, using mental methods •Progress to formal written methods calculations as above •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. **Measurement - Length and Perimeter** •measure the perimeter of simple 2-D shapes •measure, compare, add and subtract: lengths (m/cm/mm) •solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction **Number – Fractions** •Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts •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 use fractions as numbers: unit fractions and non-unit fractions with small denominators	**Measurement – Money** •add and subtract amounts of money to give change, using both £ and p in practical contexts **Measurement - Statistics** •interpret and present data using bar charts, pictograms and tables •solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables **Number – Fractions** •recognise and show, using diagrams, equivalent fractions with small denominators •Reason about the location of any fraction within 1 in the linear number system. •compare and order unit fractions, and fractions with the same denominators •Add and subtract fractions with the same denominator, within 1. •solve problems using all fraction knowledge **Measurement – Time** •tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks •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, a.m./p.m., morning, afternoon, noon and midnight •know the number of seconds in a minute and the number of days in each month, year and leap year •compare durations of events **Geometry – Properties of Shapes**

•solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction **Number – Addition and Subtraction** •Secure fluency in addition and subtraction facts that bridge 10, through continued practice. •add and subtract numbers mentally, including: HTU+U, HTU+T and HTU+H •add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction •solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction •estimate the answer to a calculation and use inverse operations to check answers **Number – Multiplication and Division** •recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables •Apply known multiplication and division facts to solve contextual problems with different structures, including quotative and partitive division •write and calculate mathematical statements for multiplication and division using the multiplication tables that they know using mental methods •solve problems, including missing number problems, involving multiplication and division facts that they know, including positive integer scaling problems •Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10)	**Measurement – Mass and Capacity** •measure, compare, add and subtract: mass (kg/g); volume/capacity (l/ml)	•draw 2-D shapes •make 3-D shapes using modelling materials recognise 3-D shapes in different orientations and describe them •recognise angles as a property of shape or a description of a turn •identify right angles, recognise that two right angles make a halfturn, three make three quarters of a turn and four a complete turn •Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations. •identify whether angles are greater or less than right angle •identify horizontal and vertical lines and pairs of perpendicular and parallel lines

Ready to progress criteria for Year 4 – the children should be able to do these things by the end of each unit/whole term. If this is not the case, intervention should be put in place to ensure these specific gaps are filled.

Autumn	Spring	Summer
Number – Place Value •Know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100; apply this to identify and work out how many 100s there are in other four-digit multiples of 100 •Recognise the place value of each digit in four-digit numbers and compose and decompose four-digit numbers using standard and nonstandard partitioning. •count in multiples of 25 and 1000 •find 1000 more or less than a given number •count backwards through zero to include negative numbers •order and compare numbers beyond 1000 •identify, represent and estimate numbers using different representation •Reason about the location of any 4-digit number in the linear number system, including identifying the previous and next multiple of 100 and 1000 •round any number to the nearest 10, 100 or 1000 •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 **Number – Addition and Subtraction** •add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate •estimate and use inverse operations to check answers to a calculation •solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	**Measurement-Length and Perimeter** •Convert between different units of measure, estimate, compare and calculate different measures, including money in pounds and pence •measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres •Solve simple perimeter and measure problems **Number – Multiplication and Division** •recall multiplication and division facts for multiplication tables up to 12 × 12 •multiplying together three numbers •recognise and use factor pairs and commutativity in mental calculations •multiply two-digit and three-digit numbers by a one-digit number using formal written layout •divide two-digit and three-digit numbers by a one-digit number •estimate and use inverse operations to check answers to a calculation •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 **Number - Fractions** •recognise and show, using diagrams, families of common equivalent fractions •count up and down in hundredths; •add fractions with the same denominator •subtract fractions with the same denominator •Reason about the location of mixed numbers in the linear number system.	**Number - Decimals** •round decimals with one decimal place to the nearest whole number •compare numbers with the same number of decimal places up to two decimal places •recognise and write decimal equivalents to ¼, ½ and ¾ •solve simple measure problems involving fractions and decimals to two decimal places **Measurement – Money and Time** •Convert between different units of measure-pounds and pence •solve simple money problems involving fractions and decimals to two decimal places •read, write and convert time between analogue and digital 12- and 24-hour clocks •Convert between different units of measure (e.g. hours to minutes) •solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days •solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why •solve problems involving multiplying and adding **Statistics** •interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs •solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs

•Solve number and practical problems that involve all of the above and with increasingly large positive numbers, number and place value **Number- Multiplication and Division** •find the effect of multiplying and 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 •Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 100) •use place value, known and derived facts to multiply and divide mentally, including multiplying by 0 and 1; dividing by 1; •Manipulate multiplication and division equations and understand and apply the commutative property of multiplication. •Understand and apply the distributive property of multiplication. •count in multiples of 6, 7, 9, •recall multiplication and division facts for multiplication tables up to 12 × 12 6 TIMES TABLES, 7 TIMES TABLES, 9 TIMES TABLES •Solve division problems, with two-digit dividends and one-digit divisors, that involve remainders, and interpret remainders appropriately according to the context. **<u>Measurement - Area</u>** •find the area of rectilinear shapes by counting squares	•Convert mixed numbers to improper fractions and vice versa •Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers. •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 •recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. •recognise and write decimal equivalents of any number of tenths or hundredths •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 •solve simple measure and money problems involving fractions and decimals to two decimal places **<u>Number - Decimals</u>** •round decimals with one decimal place to the nearest whole number •compare numbers with the same number of decimal places up to two decimal places •recognise and write decimal equivalents to ¼, ½ and ¾	**<u>Geometry-Properties of Shape and Position and Direction</u>** •compare and classify geometric shapes, including quadrilaterals and triangles, based on properties and sizes. Identify regular polygons, including equilateral triangles and squares, as those in which the side-lengths are equal, and the angles are equal. •identify acute and obtuse angles and compare and order angles up to two right angles by size •Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant. •describe positions on a 2-D grid as coordinates in the first quadrant •plot specified points and draw sides to complete a given polygon •describe movements between positions as translations of a given unit to the left/right and up/down •Find the perimeter of regular and irregular polygons •identify lines of symmetry in 2-D shapes presented in different orientations •complete a simple symmetric figure with respect to a specific line of symmetry

Continuous objectives that should be included in all teaching throughout the year – particularly through regular problem solving and reasoning.

- solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction
- estimate the answer to a calculation and use inverse operations to check answers
- solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction
- 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.
- solve problems using all fraction knowledge

- estimate and use inverse operations to check answers to a calculation
- solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why
- 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
- 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
- solve simple measure and money problems involving fractions and decimals to two decimal places
- solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days

Solve number and practical problems that involve all of the above and with increasingly large positive numbers, number and place value

Key Basic Skills – these should be the focus of daily retrieval practice. This could be through starters, Catch One Partner or separate activities throughout the day

Count from zero in multiples of 4, 8, 50 and 100 using bridging strategies as appropriate
Recall multiplication facts and related division facts for 3, 4, 8 times tables
Add and subtract a series of one-digit numbers
Use knowledge of complements to 100 to find change from £1
Use knowledge of complements to 30 to calculate time within half an hour
Find 10 or 100 more or less than a given number
Read and write numbers up to 1000
Recognise the place value of each digit in a three-digit number
Compare and order numbers up to 1000
Partition numbers into place value columns
Partition numbers in different ways
Round any three-digit number to the nearest 10 and 100
Use rounding to support estimation and calculation
Use knowledge of place value to derive new addition and subtraction facts
Use knowledge of inverse to derive associated addition and subtraction facts and check answers
Double any number between 1 and 50 and find all corresponding halves
Add and subtract mentally HTU ± U, HTU ± T and HTU ± H
Multiply any three-digit number by 10 and any two-digit number by 100
Divide any three-digit multiple of 10 by ten
Use knowledge of inverse to derive associated multiplication and division facts
Use known facts to derive nearby facts
Use known facts to derive equivalent facts
Count up and down in tenths
Recall fraction pairs to 1
Identify fractions greater or less than a half
Identify equivalent fractions with small denominators
Order fractions with the same denominator
Tell and write the time from a 12-hour analogue clock and a clock with Roman numerals and a digital clock display
Convert between money and measures including time
Recognise right angles, straight angles, half and full turns and identify whether the turn is greater, less than or the same as a right angle
Count from zero in multiples of 6, 7, 9, 25 and 1000 using bridging strategies as appropriate
Use knowledge of complements to 100 to find change from whole pounds
Use knowledge of complements to 60 to calculate time within an hour
Recall multiplication facts and related division facts for tables up to 12 x 12
Read and write numbers up to 10 000 and recognise the place value of each digit

Recognise the place value of each digit in a four-digit number
Compare and order numbers up to 10 000
Partition numbers into place value columns
Partition numbers in different ways
Round any four-digit number to the nearest 10, 100 and 1000
Use rounding to support estimation and calculation
Use knowledge of place value to derive new addition and subtraction facts
Use knowledge of inverse to derive associated addition and subtraction facts and check answers
Double any number between 1 and 100 and find all corresponding halves
Add and subtract mentally THTU ± U, THTU ± T, THTU ± H, TU ± TU and HTU ±TU
Multiply numbers including decimals by 10 and 100
Divide decimal numbers (to one decimal place) by 10
Divide four–digit whole numbers by 100
Use knowledge of inverse to derive associated multiplication and division facts
Use known facts to derive new facts
Use known facts to derive equivalent facts
Count up and down in tenths and hundredths and recognise the equivalent decimal values
Recall fraction and decimal pairs to 1
Identify fractions greater or less than a half
Identify equivalent fractions
Order, add and subtract fractions with the same denominator
Recognise decimal equivalents of fractions with a denominator of ten and one hundred and also decimal equivalents of half, one quarter and three quarters
Round decimals with one decimal place to the nearest whole number
Tell and write the time from a 12-hour analogue clock and a clock with
Roman numerals and a digital clock display
Read, tell and write the time from a 24-hour clock
Convert between 12 and 24-hour clocks
Convert between money and measures including time
Recognise right angles, straight angles, half and full turns and relate the turn to a measurement in degrees
Identify different types of angles including acute and obtuse

Barn Owls – Sequence of learning and small steps covered

Autumn Term		**Spring Term**		**Summer Term**	
Year 5 Small Steps	**Year 6 Small Steps**	**Year 5 Small Steps**	**Year 6 Small Steps**	**Year 5 Small Steps**	**Year 6 Small Steps**
Place Value Roman numerals to 1,000 Numbers to 10,000 Numbers to 100,000 Numbers to 1,000,000 Read and write numbers to 1,000,000 Powers of 10 10/100/1,000/10,000/100,000 more or less Partition numbers to 1,000,000 Number line to 1,000,000 Compare and order numbers to 100,000 Compare and order numbers to 1,000,000 Round to the nearest 10, 100 or 1,000 Round within 100,000	Place Value Numbers to 1,000,000 Numbers to 10,000,000 Read and write numbers to 10,000,000 Powers of 10 Number line to 10,000,000 Compare and order any integers Round any integer Negative numbers Four Operations Add and subtract integers Common factors Common multiples Rules of divisibility Primes to 100	Multiplication and Division Multiply up to a 4-digit number by a 1-digit number Multiply a 2-digit number by a 2-digit number (area model) Multiply a 2-digit number by a 2-digit number (formal method) Multiply a 3-digit number by a 2-digit number (formal method) Multiply a 4-digit number by a 2-digit number (formal method) Solve problems with multiplication Use short division Divide a 4-digit number by a 1-digit number Divide with remainders Choose an efficient method to divide Solve problems with multiplication and division Fractions Multiply a unit fraction by an integer Multiply a non-unit fraction by an integer Multiply a mixed number by an integer Calculate a fraction of a quantity	Ratio Use ratio language Identify and use the ratio symbol Understand ratio as fractions Complete scale drawing Use scale factors Solve ratio problems Solve proportion problems Apply ratio and proportion to recipes Algebra Complete 1-step functions Complete 2-step functions Form expressions Use substitution Use formulae Form equations Solve 1-step equations Solve 2-step equations Find pairs of values Solve problems with two unknowns Decimals Identify place value within 1 Identify place value using integers and decimals Round decimals Add and subtract decimals Multiply by 10, 100, 1000 Divide by 10, 100, 1000 Multiply decimals by integers	Shape Understand and use degrees Classify different types of angles Estimate the size of different angles Measure angles up to 180 degrees Draw lines and angles accurately Calculate angles around a point Calculate angles on a straight line Find the value of lengths and angles in shapes Identify regular and irregular polygons Identify 3D shapes Position and direction Read and plot coordinates Problem solve using coordinates Complete translation of shapes Complete translation with coordinates Identify lines of symmetry Complete reflection in vertical and horizontal lines Decimals Use known facts to add and subtract decimals within 1 Find decimal complements to 1	Shape Measure and classify angles Calculate angles Find vertically opposite angles Find angles in a triangle Find angles in a triangle – special cases Find missing angles in a triangle Find angles in a quadrilateral Find angles in polygons Name and label the parts of a circle Draw shapes accurately Identify and make nets of 3D shapes Position and direction Read and plot points in the first quadrant Read and plot points in all four quadrants Solve problems with coordinates Complete translations Complete reflections

Round within 1,000,000 <u>Addition and Subtraction</u> Mental strategies Add whole numbers with more than four digits Subtract whole numbers with more than four digits Round to check answers Inverse operations (addition and subtraction) Multi-step addition and subtraction problems Compare calculations Find missing numbers <u>Multiplication and Division</u> Multiples Common multiples Factors Common factors	Square and cube numbers Multiply up to a 4-digit number by a 2-digit number Solve problems with multiplication Short division Division using factors Introduction to long division Long division with remainders Solve problems with division Solve multi-step problems Order of operations Mental calculations and estimation Reason from known facts <u>Fractions A</u> Equivalent fractions and simplifying	Calculate a fraction of an amount Find the whole Use fractions as operators <u>Decimals and Percentages</u> Understand decimals up to 2 decimal places Find equivalent fractions and decimals (tenths) Find equivalent fractions and decimals (hundredths) Represent thousandths as decimals Represent thousandths as fractions Show thousandths on a place value chart Order and compare decimals (same number of decimal places) Order and compare decimals with up to 3 decimal places Round to the nearest whole number Round to 1 decimal place Understand percentages Represent percentages as fractions Represent percentages as decimals Find equivalent fractions, decimals and percentages <u>Perimeter and Area</u> Find the perimeter of rectangles Find the perimeter of rectilinear shapes	Divide decimals by integers Multiply and divide decimals in context <u>Fractions, Decimals and Percentages</u> Find decimal and fraction equivalents Understand fractions as division Understand percentages Convert fractions to percentages Find equivalent fractions, decimals and percentages Order fractions, decimals and percentages Find percentages of amounts in one step Find percentages of amounts in multiple steps Find percentages – missing values <u>Area, Perimeter and Volume</u> Find area and perimeter of shapes Find the area of a triangle by counting squares Find the area of right-angled triangles Find the area of any triangle Find the area of a parallelogram Find the volume by counting cubes Find the volume of a cuboid <u>Statistics</u> Read and interpret line graphs	Add and subtract decimals across 1 Add decimals with the same number of decimal places Subtract decimals with the same number of decimal places Add decimals with different numbers of decimal places Subtract decimals with different numbers of decimal places Use efficient strategies for adding and subtracting decimals Complete decimal sequences Multiply decimals by 10, 100 and 1000 Divide decimals by 10, 100 and 1000 Multiply and divide decimals to find missing values <u>Negative numbers</u> Understand what a negative number is Count through zero in 1s Count through zero in multiples Compare and order negative numbers Find the difference between negative numbers <u>Converting units</u> Convert millimetres and millilitres Convert units of length Convert between metric and imperial units	

Prime numbers Square numbers Cube numbers Multiply by 10, 100 and 1,000 Divide by 10, 100 and 1,000 Multiples of 10, 100 and 1,000 <u>Fractions</u> Find fractions equivalent to a unit fraction Find fractions equivalent to a non-unit fraction Recognise equivalent fractions Convert improper fractions to mixed numbers Convert mixed numbers to improper fractions Compare fractions less than 1 Order fractions less than 1 Compare and order fractions greater than 1	Equivalent fractions on a number line Compare and order (denominator) Compare and order (numerator) Add and subtract simple fractions Add and subtract any two fractions Add mixed numbers Subtract mixed numbers Multi-step problems <u>Fractions B</u> Multiply fractions by integers Multiply fractions by fractions Divide a fraction by an integer Divide any fraction by an integer	Find the perimeter of polygons Find the area of rectangles Find the area of compound shapes Estimate area <u>Statistics</u> Draw line graphs Read and interpret line graphs Read and interpret tables Use and interpret two-way tables Read and interpret timetables	Read and interpret dual bar charts Read and interpret pie charts Use pie charts with percentages Draw pie charts Find the mean	Convert between units of time Calculate with timetables <u>Measurement - volume</u> Find volume in cm3 Compare volume Estimate volume Estimate capacity	

Add and subtract fractions with the same denominator Add fractions within 1 Add fractions with total greater than 1 Add to a mixed number Add two mixed numbers Subtract fractions Subtract from a mixed number Subtract from a mixed number - breaking the whole Subtract two mixed numbers	Mixed questions with fractions Fraction of an amount Fraction of an amount - find the whole Measuring – Converting Units Metric measures Convert metric measures Calculate with metric measures Miles and kilometres Imperial measures				

Ready to progress criteria for Year 5 – the children should be able to do these things by the end of each unit/whole term. If this is not the case, intervention should be put in place to ensure these specific gaps are filled.

Autumn	Spring	Summer
Number – Place Value Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero Round any number up to 1 000 000 to the nearest 10, 100, 1000. 10000, 100000 Read Roman numerals to 1000 (M) and recognise years written in Roman numerals Know that 10 tenths are equivalent to 1 one and that 1 is 10 times the size of 0.1. Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01. Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01. Read and write decimal numbers as fractions Recognise the place value of each digit in numbers with up to 2 decimal places and compose and decompose numbers with up to 2 decimal places using standard and non-standard partitioning Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents Read, write, order and compare numbers with up to three decimal places Reason about the location of any number up to 2 decimal places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 Round decimals with two decimal places to the nearest whole number and to one decimal place	**Measurement** 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 centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes **Number-Multiplication and Division** Multiply and divide numbers mentally drawing upon known facts Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign **Number-Fractions** Add and subtract fractions with the same denominator and denominators that are multiples of the same number, including mixed numbers Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams To use fractions as operators Solve problems Involving multiplication and division, including scaling by simple fractions and problems involving simple ratio **Number-Decimals** Recall decimal fraction equivalents for 1/2., ¼, 1/5, 1/10 and for multiples of these proper fractions.	**Number-Decimals** To add and subtract wholes and decimal numbers To multiply and divide decimal numbers by 10, 100, 1000 Add and subtract decimal numbers mentally Solve problems involving number up to three decimal places To calculate sequences involving decimal numbers **Geometry – Properties of shape** Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles Distinguish between regular and irregular polygons based on reasoning about equal sides and angles 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 a half turn (total 180°) -other multiples of 90° Use the properties of rectangles to deduce related facts and find missing lengths and angles Identify 3-D shapes, including cubes and other cuboids, from 2-D representations **Geometry – Position and direction** 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. **Measurement** Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)

Number – Addition and Subtraction Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why Add and subtract numbers mentally with increasingly large numbers Solve number problems and practical problems that relate to all of the above (number and place value) **Number-Multiplication and Division** Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth). Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size. Multiply whole numbers by 1000 Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers Establish whether a number up to 100 is prime and recall prime numbers up to 19 Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)	Round decimals with two decimal places to the nearest whole number and to one decimal place Read, write, order and compare numbers with up to three decimal places **Number-Percentages** Recognise the per cent symbol (%) and understand that percent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal Solve problems which require knowing percentage and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25. **Statistics** Solve comparison, sum and difference problems using information presented in a line graph Complete, read and interpret information in tables, including timetables.	Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints Estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water] To read and interpret timetables Solve problems involving converting between units of time Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.

Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers **<u>Number-Fractions</u>** Find non-unit fractions of quantities Find equivalent fractions and understand that they have the same value and the same position in the linear number system including tenths and hundredths Compare and order fractions whose denominators are all multiples of the same number Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number Compare and order fractions less than and greater than 1 Add and subtract fractions with the same denominator and denominators that are multiples of the same number, including mixed numbers		

Ready to progress criteria for Year 6 – the children should be able to do these things by the end of each unit/whole term. If this is not the case, intervention should be put in place to ensure these specific gaps are filled.

Autumn	Spring	Summer
Number –Place Value •Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000). •read, write, order and compare numbers up to 10 000 000 and determine the value of each digit and compose and decompose numbers up to 10 million using standard and nonstandard partitioning •Reason about the location of any number up to 10 million, and compose and decompose numbers up to 10 million, using standard and non-standard partitioning. •round any whole number to a required degree of accuracy •Divide powers of 10, from 1 hundredth, to 10 million, into 2, 4, 5 and 10 equal parts and read scales/ number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts •use negative numbers in context, and calculate intervals across zero **Number –Four operations** •Perform mental calculations, including with mixed operations and large numbers •Understand that 2 numbers can be related additively or multiplicatively and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number). •Use a given additive calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships and place value understanding.	**Number – Decimals and Percentages** •associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction •identify the value of each digit in numbers given to three decimal places •multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places •multiply one-digit number with up to two decimal places by whole numbers •use written division methods in cases where the answer has up to two decimal places •recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. •solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts •solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison **Number - Algebra** •use simple formulae •generate and describe linear number sequences •express missing number problems algebraically •find pairs of numbers that satisfy an equation with two unknowns •enumerate possibilities of combinations of two variables. **Measurement – Perimeter, Area and Volume** •recognise that shapes with the same areas can have different perimeters and vice versa	**Geometry – Position and Direction** •describe positions on the full coordinate grid (all four quadrants) •draw and translate simple shapes on the coordinate plane and reflect them in the axes. **Geometry – Properties of shape** •Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems. •compare and classify geometric shapes based on their properties and sizes •recognise, describe and build simple 3-D shapes, including making nets •find unknown angles in any triangles, quadrilaterals, and regular polygons •illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius •recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles

•identify common factors •multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication •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 •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 context **Number -Fractions** •identify common multiples and prime numbers •use their knowledge of the order of operations to carry out calculations involving the four operations •use common factors to simplify fractions •use common multiples to express fractions in the same denomination •Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy •add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions •Add and subtract mixed numbers, using the concept of equivalent fractions •multiply simple pairs of proper fractions, writing the answer in its simplest form •Multiply fractions by integers •divide proper fractions by whole numbers **Measurement-Converting units** •use, read, write and convert between standard units, converting measurements of length, mass, volume and	•recognise when it is possible to use formulae for area and volume of shapes •calculate the area of parallelograms and triangles •calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3), and extending to other units. **Number – Ratio** •solve problems involving ratio relationships. •solve problems involving similar shapes where the scale factor is known or can be found •solve problems involving unequal sharing and grouping using knowledge of fractions and multiples. •solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts •Solve problems with 2 unknowns **Statistics** •interpret and construct pie charts and line graphs calculate interpret the mean as an average •use pie charts and line graphs to solve problems	

time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3.d.p		

Continuous objectives that should be included in all teaching throughout the year – particularly through regular problem solving and reasoning.

Solve number problems and practical problems that relate to all of the above (number and place value)
Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
Solve problems involving number up to three decimal places
Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
Solve problems Involving multiplication and division, including scaling by simple fractions and problems involving simple ratio
Solve problems which require knowing percentage and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25.
Solve problems involving converting between units of time
Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.
Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
Solve problems involving addition, subtraction, multiplication and division
Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
Solve problems which require answers to be rounded to specified degrees of accuracy
Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts
Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison
Solve problems involving similar shapes where the scale factor is known or can be found
Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.
Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate

Key Basic Skills – these should be the focus of daily retrieval practice. This could be through starters, Catch One Partner or separate activities throughout the day

Count forward and backwards in steps of powers of 10 for any given number up to 1 000 000
Read and write numbers up to 1 000 000 and determine the place value of each digit
Recognise the place value in large whole numbers to at least 1 000 000
Compare and order numbers to at least 1 000 000
Partition numbers into place value columns
Partition numbers in different ways
Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000
Use rounding to support estimation and calculation
Use knowledge of place value to derive new addition and subtraction facts
Secure fluency in multiplication table facts, and corresponding division facts, through continued practice
Identify multiples and common factors of two or more numbers
Find factor pairs of a two-digit number
Understand the terms multiple, factor, and prime, square and cube numbers and use them to construct equivalent statements
Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.
Establish whether a number up to 100 is prime and recall prime numbers up to 19
Can find the prime factors of a given number
Read and recognise Roman numerals up to 1000
Recognise and use square and cube numbers
Double any number between 1 and 1000 and find all corresponding halves
Add and subtract mentally with increasingly large numbers to aid fluency e.g. TthTHTU ± THTU, TthTHTU ± HTU, HTU.t ± HTU.t
Multiply and divide whole numbers including those involving decimals by 10, 100 and 1000
Use knowledge of inverse to derive associated multiplication and division facts
Use known facts and knowledge of multiples to derive new facts
Count up and down in tenths, hundredths and thousandths in decimals and fractions including bridging zero
For fractions and decimals derive pairs with complements to 1 and to other whole numbers
Identify equivalent fractions
Recognise decimal equivalents of fractions with a denominator of ten, one hundred and one thousand
Read and write decimal numbers with up to 3 decimal places as fractions
Read, write order and compare numbers with up to three decimal places
Round decimals with up to two decimal places to the nearest whole number and to one decimal place
Know percentage and decimal equivalents of 1/2 , 1/4,1/5 ,2/5 , 4/5, and those fractions with a denominator of a multiple of 10 or 25
Use knowledge of complements to 60 and that there are 60 minutes in an hour to convert time durations

Count forward and backwards in steps of powers of 10 for any given number up to 10 000 000
Count forwards and backwards with positive and negative whole number including zero and calculate intervals across zero

Read, write, order and compare numbers up to 10 000 000 and determine the place value of each digit
Partition numbers into place value columns
Partition numbers in different ways
Round any whole number to a required degree of accuracy
Use rounding to support estimation and calculation
Use knowledge of place value to derive new addition and subtraction facts
Recognise and use square and cube numbers
Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.
Establish whether a number up to 100 is prime and recall prime numbers up to 19
Double any number between 1 and 1000 and find all corresponding halves
Add and subtract mentally with jottings with increasingly large numbers to aid fluency E.g. HthTthTHTU ± TthTHTU TthTHTU ± THTU HTU.t ± TU.t
Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 giving answers up to 3 decimal places
Perform mental calculations including with mixed operations
Count up and down in tenths, hundredths and thousandths in decimals and fractions including bridging zero for example on a number line
Use their knowledge of the order of operations to carry out calculations involving the four operations
Use factors to simplify fractions
Compare and order decimals and fractions including fractions >1
Calculate simple percentages of amounts
Recognise mixed numbers and improper fractions and convert from one form to another and write mathematical statements > 1 as a mixed number
Derive decimal complements to 1 working with decimals up to 3 decimal places
Recall and derive equivalences between fractions, decimals and percentages
Convert between money and measures including time