Progression Map

Mathematics

3 I's: Intent, Implementation, Impact

Intent
At Northfield Primary School we value every pupil and the contribution they make in all subjects, including mathematics. We believe that our children should leave primary education as confident, resilient mathematicians who have a secure understanding of the skills required to approach any maths problem. As a result, we aim to ensure that every child enjoys and achieves success in mathematics and that they develop their mathematical knowledge and skills through high-quality teaching. We pride ourselves on providing pupils with many opportunities to explore and develop an understanding of mathematics that will be relevant and useful in their future studies and in the world of work. We appreciate that mathematics is an essential skill within school and everyday life therefore we deliver a high-quality mathematics education to enable our children to have a foundation for understanding the world, an ability to reason mathematically and to be curious about the subject. Our aims at Northfield: • To develop competence, confident and fluency in mathematical knowledge, concepts and skills. • To develop an ability to solve problems, to reason, to think logically and to work systematically and accurately. • To deepen an ability to work both independently and in cooperation with others, being able to explain mathematical concepts to our peers. • To apply knowledge, skills and ideas to real life contexts outside the classroom and to understand the value and uses of mathematics in the wider world. We pride ourselves on providing pupils with many opportunities to explore and develop their mathematical understanding via a mastery approach. Our curriculum is progressive: blocks of new learning build directly upon previous learning, term on term and year on year. Practise and consolidation play a central role to our curriculum and mathematics learning. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts in tandem. Mathematical knowledge and vocabulary are introduced and revisited regularly to support children to know more and remember more.
Implementation
Our Maths curriculum provides breadth and balance; is engaging and relevant to the needs of our children; is differentiated to the abilities of our children to ensure they excel. We believe that the key to children becoming successful mathematicians is the consistent use of representations. Therefore, we promote the concrete-pictorial-abstract approach. Mathematical understanding is developed firstly through the use of concrete apparatus. This will progress into pictorial representations and finally abstract written methods and problem solving. Maths is taught daily with additional time to practice and revisit fluency skills during some morning activities during registration. To ensure consistency and progression, Maths at Northfield is planned and sequenced using the 'White Rose' schemes. Our medium-term plans have been created in line with the White Rose scheme, but we may amend the order and length of blocks to meet the needs of our children. Lessons are taught using a teach/task approach. They progress through a series of small steps to develop children's understanding of what is being taught. New concepts are explored and modelled by the teacher; children have opportunities for discussion with partners which prompts reasoning and supports vocabulary development. Independent practice provides the means for all children

to develop their fluency further, before progressing to more complex related problems. The large majority of children progress through the curriculum content at the same pace. Adaptation is achieved by appropriate scaffolding and through individual/group support and intervention.

Teaching staff use assessment for learning, identifying and addressing any misconceptions as and when they arise. They deliver targeted focus groups, interventions and boosters based on assessment of work produced to ensure that all children are ready to move on. Termly NFER tests and past-SAT papers are used as a diagnostic tool to support teacher assessment and judgements on children's attainment and progress. Results of the these assessments are used to identify gaps in learning and to ensure that teachers are adapting learning to meet the needs of children; teachers use this information to support planning and interventions.

The development of times tables plays an important role in our maths learning, with children developing their fluency in rapid recall of times tables up to 12 x 12 by the end of year 4. This knowledge is then embedded further in Upper Key Stage 2 to ensure that children have facts at their fingertips. To support this, we use 'Times Tables Rockstars', an online package, which is used for children to practice their tables fact and teachers to assess the speed and accuracy of children from Year 2 – Year 6. Times tables are a focus within every classroom and the children are encouraged to practice at home. Each classroom has a working wall which will have information, models and representations to support the children's current learning as well as key vocabulary.

Reading is given high priority in maths lessons. Pupils are supported to deconstruct and comprehend worded problems, identifying and discussing the meaning of important mathematical vocabulary and thinking about what information they can retrieve from questions and what mathematical knowledge they need in order to solve the problem. We work in partnership with the East Midlands Maths Hub and the NCETM, including participating in teacher research groups, to ensure that we are keeping up-to-date with current developments in mathematics.

Impact

We aspire that pupils at Northfield become mathematicians who demonstrate a thirst for learning and love of maths. By the end of Year 6 we want our pupils to have developed a wealth of mathematical knowledge and skills that will ensure they are ready to progress to the secondary curriculum. To ensure that the teaching of maths is consistent throughout school and of high quality, we monitor its impact in a variety of ways. We conduct learning walks and lesson visits; look at learning in books; carry out pupil interviews; and conference with staff.
We will monitor children to ensure they are meeting or exceeding their potential in various ways:
-Children are enthusiastic and confident mathematicians.
-Children display a resilient attitude towards solving mathematical problems.
-Children can recall their times tables up to 12 x 12 accurately by Year 4 and their relevant times tables in Years 1-3.
-Children have the mathematical language and vocabulary they need to explain their reasoning.
-Children can explain what steps they have taken to solve a calculation or problem.
-Children are competitive to beat their personal best scores in times tables quizzes and weekly arithmetic challenges.
-Children become more accurate at solving arithmetic style questions and can work at speed.

National Curriculum Aims
The National Curriculum for mathematics aims to ensure that all pupils: • Become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. • Reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language. • Can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.
EYFS
Children at the expected level of development by the end of the EYFS will: • Have a deep understanding of number to 10, including the composition of each number. • Be able to subitise up to 5. • Automatically recall number bonds up to 5, and some number bonds to 10 (including subtraction and double facts). • Verbally count beyond 20; recognising the pattern of the counting system. • Compare quantities up to 10 in different contexts. • Explore and represent patterns within numbers up to 10, including evens, odds, doubles and even distribution.
Key Stage 1
Pupils should: • develop confidence and mental fluency with whole numbers, counting and place value including working with numerals, words and the four operations. • Develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. • Use a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money. • Know the number bonds to 20 and be precise in using and understanding place value, by the end of year 2. • Read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

Lower Key Stage 2
Pupils should: • Become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. • Develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. • Develop their ability to solve a range of problems, including with simple fractions and decimal place value. • Draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. • Use measuring instruments with accuracy and make connections between measure and number. • Have memorised their multiplication tables up to and including the 12 times table and show precision and fluency in their work, by the end of year 4. • Read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.
Upper Key Stage 2
Pupils should: • Extend their understanding of the number system and place value to include larger integers. • Develop connections between multiplication and division with fractions, decimals, percentages and ratio. • Develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. • Use algebra as a means for solving a variety of problems. • Consolidate and extend knowledge developed in number within geometry and measures. • Classify shapes with increasingly complex geometric properties and learn the vocabulary they need to describe them. • Be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages, by the end of year 6. • Pupils should read, spell and pronounce mathematical vocabulary correctly.

Year 1 – Yearly Overview												
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	**Number: Place Value (within 10)** 1NPV-1 1NPV-2					**Number: Addition & Subtraction (within 10)** 1NF-1 1AS-1 1AS-2					Assessment Week	**Geometry: Shape** 1G-1 1G-2
Spring	**Number: Place Value (within 20)** 1NPV-1 1NPV-2			**Number: Addition & Subtraction (within 20)** 1NPV-2 1AS-2			**Number: Place Value (within 50: multiples of 2, 5, 10 to be included)** 1NPV-1 1NPV-2 1NPV-2		**Measurement: Length & Height** 1NPV-2		Assessment Week	**Measurement:** Weight & Volume
Summer	**Number: Multiplication & Division (Reinforce multiples of 2, 5 and 10)** 1NF-2			**Number: Fractions**	**Geometry: Position & Direction**		**Number: Place Value (within 100)** 1NPV-1 1NF-1		**Measurement: Money** 1NF-2	**Measurement: Time**	Assessment Week	**Measurement: Time**

Blocks are based on the White Rose Scheme of Work Version 3. Teachers may use their judgement to adjust the lengths of blocks if required to cater for pupils' needs. Numerical codes link to the corresponding Ready to Progress criteria for the block of work.

Year 2 – Yearly Overview												
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	**Number: Place Value** 2NPV-1 2NPV-2			**Number: Addition & Subtraction** 2NF-1 2AS-1 2AS-2 2AS-3 2AS-4						**Geometry: Properties of shape** 2G-1	**Assessment Week**	**Geometry: Properties of shape** 2G-1
Spring	**Measurement: Money** 2NPV-2 2AS-2 2AS-4			**Number: Multiplication & Division** 2MD-1 2MD-2				**Measurement: Length & Height** 2AS-4		**Measurement: Mass, temperature & capacity** 2MD-1	**Assessment Week**	**Measurement: Mass, temperature & capacity** 2MD-1
Summer	**Number: Fractions**			**Measurement: Time**		**End of KS1 Assessments**	**Measurement: Time**	**Statistics** 2MD-1		**Geometry Position & Direction**		**Readiness for Year 3 (Calculations)**

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Year 3 – Yearly Overview												
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	**Number: Place Value** 3NPV-1 3NPV-2 3NPV-3 3NPV-4			**Number: Addition & Subtraction** 3NPV-1 3NF-1 3AS-1 3AS-2 3AS-3					**Number: Multiplication & Division** 3NPV-1 3NF-2 3MD-1		**Assessment Week**	**Number: Multiplication & Division** 3NF-2 3MD-1
Spring	**Number: Multiplication & Division** 3NF-3 3MD-1		**Measurement: Length and Perimeter** 3NPV-3 3NF-3			**Number: Fractions** 3F-1 3F-2 3F-3 3F-4			**Measurement: Mass and Capacity** 3NPV-4		**Assessment Week**	**Measurement: Mass and Capacity** 3NPV-4
Summer	**Number: Fractions** 3F-1 3F-2 3F-3 3F-4		**Measurement: Money** 3NPV-1 3AS-1 3AS-3		**Measurement: Time**			**Geometry: Properties of shape** 3G-1 3G-2	**Statistics**		**Assessment Week**	**Statistics**

Blocks are based on the White Rose Scheme of Work Version 3. Teachers may use their judgement to adjust the lengths of blocks if required to cater for pupils' needs. Numerical codes link to the corresponding Ready to Progress criteria for the block of work.

Year 4 – Yearly Overview												
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	**Number: Place Value** 4NPV-1 4NPV-2 4NPV-3 4NPV-4				**Number: Addition & Subtraction** 4NF-3			**Measurement: Area**	**Number: Multiplication & Division** 4NPV-1 4NF-1 4NF-2		**Assessment Week**	**Number: Multiplication & Division** 4MD-1 4MD-2 4MD-3
Spring	**Number: Multiplication & Division** 4NF-1 4NF-2 4NF-3 4MD-1 4MD-2 4MD-3		**Measurement: Length and Perimeter** 4G-2		**Number: Fractions** 4F-1 4F-2 4F-3				**Number: Decimals**		**Assessment Week**	**Number: Decimals**
Summer	**Number: Decimals**		**Measurement: Money**		**Measurement: Time**		**Geometry: Properties of shape** 4G-2 4G3		**Statistics** 4NPV-4	**Geometry: Position & Direction** 4G-1	**Assessment Week**	**Geometry: Position & Direction** 4G-1

Blocks are based on the White Rose Scheme of Work Version 3. Teachers may use their judgement to adjust the lengths of blocks if required to cater for pupils' needs. Numerical codes link to the corresponding Ready to Progress criteria for the block of work.

Year 5 – Yearly Overview												
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	**Number: Place Value**			**Number: Addition & Subtraction**		**Number: Multiplication & Division** 5NF-1 5NF-2 5MD-1 5MD-2			**Number: Fractions** 5F-1 5F-2		**Assessment Week**	**Number: Fractions** 5F-1 5F-2
Spring	**Number: Multiplication & Division** 5NF-1 5MD-3 5MD-4			**Number: Fractions** 5NF-1 5F-1 5F-2 5F-3		**Number: Decimals & Percentages** 5NPV-1 5NPV-2 5NPV-3 5NPV-4			**Measurement: Area & Perimeter** 5G-2		**Assessment Week**	**Statistics** **5NPV-4**
Summer	**Geometry: Properties of shape** 5G-1			**Geometry: Position & Direction**		**Number: Decimals** 5NF-2 5MD-1 5NPV-2 5NPV-3 5NPV-4			**Number: Negative Numbers**	**Measurement: Converting Units** 5NPV-5	**Assessment Week**	**Measurement: Volume**

Blocks are based on the White Rose Scheme of Work Version 3. Teachers may use their judgement to adjust the lengths of blocks if required to cater for pupils' needs. Numerical codes link to the corresponding Ready to Progress criteria for the block of work.

Year 6 – Yearly Overview												
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	**Number: Place Value** 6NPV-1 6NPV-2 6NPV-3 6NPV-4			**Number: Four operations** 6AS/MD-1 6AS/MD-2				**Number: Fractions** 6F-1 6F-2 6F-3			**Assessment Week**	**Number: Fractions** 6F-1 6F-2 6F-3
Spring	**Measurement: Converting Units** 6NPV-4	**Geometry: Position & Direction**	**Number: Ratio** 6AS/MD-1 6AS/MD-3		**Number: Algebra** 6AS/MD-4		**Number: Decimals** 6NPV-1 6NPV-2 6NPV-4		**Number: Decimals & Percentages**		**Assessment Week**	**Measurement: Area, perimeter & volume** 6G-1
Summer	**Statistics** 6NPV-4		**Geometry: Properties of shape angles** 6G-1	**KS2 SATS WEEK**	Ensuring readiness for Year 7 Units will be planned based on the needs of the cohort							

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Maths Progression Plan							
Number	**EYFS**	**Key Stage One**		**Key Stage Two**			
	Three and Four-Year Olds Reception Early Learning Goal	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Counting	• Recite numbers past 5. • Say number name for each item in order: 1, 2, 3, 4 , 5. • Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle'). • Count objects, actions and sounds. • Count beyond ten. • Verbally count beyond 20, recognising the pattern of the counting system.	• Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number. • Count numbers to 100 in numerals; count in multiples of twos, fives and tens.	• Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward.	• Count from 0 in multiples of 4, 8, 50 and 100. • Find 10 or 100 more or less than a given number.	• Count in multiples of 6, 7, 9, 25 and 1000. • Count backwards through zero to include negative numbers.	• 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.	

Identifying, representing and estimating numbers (including reading and writing numbers)	• Develop fast recognition of up to 3 objects, without having to count them individually ('subitising'). • Show 'finger numbers' up to 5. • Link numerals and amounts: for example showing the right number of objects to match the numeral, up to 5. • Experiment with their own symbols and marks as well as numerals. • Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5. • Experiment with their own symbols and marks as well as numerals. • Subitise. • Link the number symbol (numeral) with its cardinal number value. • Subitise (recognising quantities without counting) up to 5.	• Identify and represent numbers using objects and pictorial representations. • Read and write numbers from 1 to 20 in numerals and words. • Count, read and write numbers to 100 in numerals.	• Read and write numbers to at least 100 in numerals and in words. • Identify, represent and estimate numbers using different representations, including the number line.	• Identify, represent and estimate numbers using different representations. • Read and write numbers up to 1000 in numerals and in words.	• Identify, represent and estimate numbers using different representations, including the number line. • 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.	• Read and write (order and compare) numbers to at least 1 000 000 and determine the value of each digit. • Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	• Read, *say* and write, numbers up to 10 000 000 *accurately* and determine the value of each digit.

Rounding					• Round any number to the nearest 10, 100 or 1000.	• Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.	• Round any whole number to a required degree of accuracy.
Solving Problems	• Solve real world mathematical problems with numbers up to 5.	• Practise ordinal numbers and solve simple concrete problems.	• Use place value and number facts to solve *related* problems *to develop fluency*.	• Solve number problems and practical problems involving these ideas.	• Solve number and practical problems that involve all of the above and with increasingly large positive numbers.	• Solve number problems and practical problems that involve all of the above.	• Use negative numbers in context, and calculate intervals across zero. • Solve number and practical problems that involve all of the above.

Addition & Subtraction	EYFS	Key Stage One		Key Stage Two			
	Three and Four-Year Olds Reception Early Learning Goal	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Number Bonds	• Automatically recall number bonds for numbers 0-5 and some to 10. • Automatically recall (without reference to rhymes, counting, or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.	• *Memorise*, represent and use number bonds and related subtraction facts within 20.	• Recall all number bonds to and within 10 and use these to reason with and calculate bonds to and within 20, recognising other associated additive relationships. • Recall and use addition and subtraction facts to 20 *to become fluent in deriving associative facts (e.g. 10 – 7 = 3, 100 – 70 = 30)* and derive and use related facts up to 100.				

Written Calculations		• Read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs. • Add and subtract one-digit and two-digit numbers to 20, including zero.	• *Begin to record addition and subtraction in columns to support place value and prepare for formal written methods with larger numbers.* • Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: -a two-digit number and ones -a two-digit number and tens -two two-digit numbers -adding three one-digit numbers.	• Add and subtract numbers mentally, including: -a three-digit number and ones -a three-digit number and tens -a three digit number and hundreds • *Use the understanding of place value and partitioning to enable* adding and subtracting numbers with up to three digits, using formal written methods of columnar addition and subtraction *to become fluent*.	• Add and subtract numbers with up to four digits using the formal written methods of columnar addition and subtraction where appropriate.	• Add and subtract whole numbers with more than four digits, including using formal written methods of columnar addition and subtraction fluently.	• Perform mental calculations, including with mixed operations and large numbers. • Use their knowledge of the order of operations to carry out calculations involving the four operations (BIDMAS).

Solve Problems	• Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly.	• *Discuss* and solve one-step problems *(in familiar practical contexts)* that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems, e.g. 7 = ? - 9 *Problems include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are enable to use these operations flexibly.*	• Solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities, and measures. • Apply their increasing knowledge of mental and written methods. • Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	• 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 addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. • Estimate and use inverse operations to check answers to a calculation.	• 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 and a combination of these, including understanding the meaning of the equals sign. • 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. • Round answers to a specified degree of accuracy, for example, to the nearest 10, 20, 50 etc., but not to a specified number of significant figures.

Multiplication & Division	EYFS	Key Stage One		Key Stage Two			
	Three and Four-Year Olds Reception Early Learning Goal	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Recall Multiplication & Division Facts			• Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers. • Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.	• Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.	• Recall and use multiplication and division facts up to 12 x 12. • Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers. • Recognise and use factor pairs and commutativity in mental calculations.	• 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}). • Use multiplication and division facts up to 12 x 12 and derive associated facts.	• Identify common factors, common multiples and prime numbers. • Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. • Recall and use multiplication and division facts up to 12 x 12 and derive associated facts.

Written Calculations			• Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs. • Begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations.	• 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 efficient mental and progressing to formal written methods.	• Multiply two-digit and three-digit numbers by a one-digit number using the formal written layout of short multiplication. • Become fluent in the formal written method of short division with exact answers.	• Multiply numbers up to four digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers fluently. • Multiply and divide numbers mentally drawing upon known facts. • Divide numbers up to four digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context. • Multiply and divide whole numbers and those involving	• Multiply multi-digit numbers up to four digits by a two-digit whole number using the formal written method of long multiplication. • Divide numbers up to four 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 four digits by a two-digit number using the formal written method of short division where appropriate,

						decimals by 10, 100 and 1000.	interpreting remainders according to the context. • Perform mental calculations, including with mixed operations and large numbers.
Combined Operations						• Solve problems, including in missing number problems, involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign (to indicate equivalence).	• Use their knowledge of the order of operations to carry out calculations involving the four operations.

Solve Problems		• 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.	• Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.	• Solve problems *in contexts, deciding which of the four operations to use and why.* These include 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 *two-step* problems *in contexts* 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 multiplication and division including using their knowledge of factors and multiples, squares and cubes. • Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.	• 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.

Fractions	EYFS	Key Stage One		Key Stage Two			
	Three and Four-Year Olds Reception Early Learning Goal	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Counting			• Count in fractions up to 10, starting from any number and using the $\frac{1}{2}$ and $\frac{2}{4}$ equivalence on the number line.	• 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 ten.	• Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.	• Extend counting from year 4, using decimals and fractions including bridging zero, for example on a number line. • Continue to practise counting forwards and backwards in simple fractions.	• Extend counting from year 4, using decimals and fractions including bridging zero, for example on a number line. • Continue to practise counting forwards and backwards in simple fractions.

Recognising, finding and naming 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. • Connect halves and quarters to the equal sharing and grouping of sets of objects and to measures, as well as recognising and combining halves and quarters as parts of a whole.	• Recognise, find, name, identify and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ of a length, number, shape, set of objects or quantity and know that all parts must be equal parts of the whole.	• Recognise, understand and use fractions as numbers: unit fractions and non-unit fractions with small denominators; as numbers on the number line (going beyond 0 -1 and relating this to measure), and deduce relations between them, such as size and equivalence. • Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.	• Make connections between fractions of a length, of a shape and as a representation of one whole or set of quantities. • Know that decimals and fractions are different ways of expressing numbers and proportions. • Understand the relation between non-unit fractions and multiplication and division of quantities, with particular emphasis on tenths and hundredths.	• Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths. • Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number.	

Equivalence, comparing and ordering			• Recognise the equivalence $\frac{2}{4}$ and $\frac{1}{2}$	• Recognise and show, using diagrams, equivalent fractions with small denominators. • Compare and order unit fractions, and fractions with the same denominators.	• Recognise and show, using diagrams, families of common equivalence fractions.	• Compare and order fractions whose denominators are all multiples of the same number.	• Use common factors to simplify fractions; use common multiples to express fractions in the same denomination. To compare and order fractions, including fractions > 1.

Fractions: Calculations			• Write simple fractions for example, $\frac{1}{2}$ of 6 = 3	• Add and subtract fractions with the same denominator within one whole (e.g. $\frac{5}{7}+\frac{1}{7}=\frac{6}{7}$) *through a variety of increasingly complex problems to improve fluency.*	• Add and subtract fractions with the same denominator *to become fluent through a variety of increasingly complex problems beyond one whole.*	• Add and subtract fractions with the same denominator and denominators that are multiples of the same number (*to become fluent through a variety of increasingly complex problems)*. • Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.	• Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions. • Multiply simple pairs of proper fractions, writing the answer in its simplest form *(e.g.* $.\frac{1}{4}x\ \frac{1}{2}=\frac{1}{8}$) • Divide proper fractions by whole numbers (e.g. $.\frac{1}{3}\div 2=.\frac{1}{6}$)

Fractions: Solve problems				• Solve problems that involve all of the above.	• 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 increasingly complex problems involving all of the above.	• Solve increasingly complex problems involving all of the above.
Decimals: Recognise, write, compare and order					• To learn decimal notation and the language associated with it, including in the context of measurements. • To recognise and write decimal equivalents of any number of tenths or hundredths. • To read and write decimal equivalents to ¼, ½, ¾ . • To compare numbers, amounts and quantities with the same number of decimal places up to two decimal places.	• To read, say and write decimal numbers as fractions (e.g. $0.71 = 0.71 = \frac{71}{100}$) • To recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents. • To read, write, say, order and compare numbers with up to three decimal places.	• To identify the value of each digit in numbers given to three decimal places.

Rounding Decimals					• Round decimals with one decimal place to the nearest whole number.	• Round decimals with two decimal places to the nearest whole number and to one decimal place.	

Decimals: Calculations and problems					• 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 problems involving numbers up to three decimal places.	• Multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places. • Multiply one-digit numbers with up to two decimal places by whole numbers in practical contexts, such as measures and money. • Use written methods where the answer has up to two decimal places. • Solve problems which require answers to be rounded to specified

							degrees of accuracy.
Fractions, decimals and percentages					• Solve simple measures and money problems involving fractions and decimals to two decimal places.	• Recognise the per cent (%) and recognise the per cent 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, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25.	• Associate a fraction with division and calculate decimal fraction equivalents for a simple fraction (for example, 0.375 = $\frac{3}{8}$. • Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

Algebra	EYFS	Key Stage One		Key Stage Two			
	Three and Four-Year Olds Reception Early Learning Goal	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Ratio and proportion							• 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 (e.g. 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.

Algebra (Note: although algebraic notation is not introduced until Y6, algebraic thinking starts much earlier as exemplified by the 'missing number; objective from Y1/2/3 which are built upon in Y4/5/6.		• Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ▫ -9	• Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	• Solve problems including missing number problems.			• Introduce the language of algebra as a means for solving a variety of problems. • Introduce the use of symbols and letters to represent variables and unknowns in mathematical familiar situations, such as: missing numbers, lengths, coordinates and angles. • 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	EYFS	Key Stage One		Key Stage Two			
	Three and Four-Year Olds Reception Early Learning Goal	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Measurement: Using and Converting Units of Measure	• Make comparisons between objects relating to size, length, weight and capacity. • Compare length, weight and capacity.	• Compare, describe and solve practical problems for: -lengths and heights (e.g. long/short, longer/shorter, tall/short, double/half). -mass and weight (e.g. heavy/light, heavier than/lighter than). -Capacity and volume (e.g. full/empty, more than/less than, half full, quarter). -time (e.g. quicker/slower, earlier/later). • Measure and begin to record the following: -lengths and heights -mass/weight -capacity and volume -time (hours, minutes, seconds).	• Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels. • Compare and order lengths, mass, volume/capacity and record the results using >, < and =.	• Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).	• Convert between different units of measure (e.g. km to m; hour to minute). • Estimate, compare and calculate different measures.	• Convert between different units of measure (e.g. km and m; cm and m; cm and mm; g and kg; l and ml. • Understand and use approximate equivalences between units and common imperial units such as inches, pounds and pints.	• Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate. • Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places. • Convert between miles and kilometres.

Telling the Time	• Begin to describe a sequence of events, real or fictional, using words, such as 'first', 'then…'.	• Sequence events in chronological order using language (e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon, evening). • 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.	• Read, tell and write the time to five minutes, including quarter past/to the hour/half 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. • Compare and sequence intervals of 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. *To begin to use digital 12-hour clocks and record their times in preparation for using digital 24-hour clocks in year 4.* • Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours. • Ese 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 (e.g. to calculate the time taken by particular events or tasks).	• Read, write and convert time between analogue and digital 12- and 24-hour clocks. • Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.	• Solve problems involving converting between units of time.	• Use, read, write, and convert between standard units, converting measurements of time from a smaller unit of measure to a larger unit, and vice versa.

Money		• Recognise and know the value of different denominations of coins and notes.	• Recognise and use symbols for pounds (£) and pence (p) accurately, recording pounds and pence separately; combine amounts to make a particular value. • Find and use different combinations of coins that equal the same amounts of money (To become fluent in counting and recognising coins). • Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change.	• Become fluent in recognising the value of coins. To add and subtract manageable amounts of money, including mixed units £ and p, to give change, using both £ and p in practical contexts.	• Estimate, compare and calculate different measures, including money in pounds and pence.	• Use all four operations to solve problems involving measure (e.g. money).	

Measurement: Perimeter, Area and Volume				• Measure the perimeter of simple 2D shapes.	• Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres. • *Know perimeter can be expressed algebraically as 2(a + b) where a and b are the dimensions in the same unit.* • Find the area of rectilinear shapes by counting squares. • *To relate area to arrays and multiplication.*	• 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 (cm^2) and square metres (m^2), use the *area of rectangles to find unknown lengths* and estimate the area of irregular shapes. • Estimate volume (e.g. using $1cm^3$ blocks to build cuboids (including cubes) and capacity (e.g. using water).	• Recognise that shapes with the same areas can have different perimeters and vice versa. • 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 (cm^3) and cubic metres (m^3), and extending to other units (for example, mm^3 and km^3).

Properties of shape	EYFS	Key Stage One		Key Stage Two			
	Three and Four-Year Olds Reception Early Learning Goal	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Recognise 2d and 3d shapes and their properties	• Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners', 'straight', 'flat', 'round'. • Select shapes appropriately: flat surfaces for a building, a triangular pattern for a roof etc. • Combine shapes to make new ones – an arch, a bigger triangle, etc. • Select, rotate and manipulate shapes in order to develop spatial reasoning skills. • Compose and decompose shapes so that children can recognise a shape can have other shapes within it, just as numbers can.	• Recognise, handle and name common 2D and 3D shapes in different orientations/sizes and relate everyday objects. • Recognise that rectangles, triangles, cuboids and pyramids are not always the same as each other (e.g. different orientations).	• Handle, identify and describe the properties of 2D shapes, including the number of sides and line symmetry in a vertical line. • Compare and sort common 2D shapes and everyday objects. • Identify 2D shapes on the surface of 3D shapes (e.g. a circle on a cylinder and a triangle on a pyramid).	• Describe the properties of 2D and 3D shapes using accurate language. • Draw 2D shapes. • Make 3D shapes using modelling materials. • Recognise 3D shapes in different orientations and describe them.	• To compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. • To identify lines of symmetry in 2D shapes presented in different orientations. •	• Distinguish between regular and irregular polygons based on reasoning about equal sides and angles. • Use the properties of rectangles to deduce related facts and find missing lengths and angles. • Identify 3D shapes, including cubes and other cuboids, from 2D representations.	• Draw 2D shapes using given dimensions and angles. • Compare and classify geometric shapes based on their properties and sizes. • Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius. • Recognise, describe and build simple 3D shapes, including making nets.

Geometry: Constructing Lines and Drawing Shapes			• Draw lines and shapes using a straight edge.	• Connect decimals and rounding to drawing and measuring straight lines in centimetres, in a variety of contexts. • Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.	• Draw with increasing accuracy and develop mathematical reasoning to analyse shapes and their properties and confidently describe the relationships between them. • Complete a simple symmetric figure with respect to a specific line of symmetry.	• Become accurate in drawing lines with a ruler to the nearest millimetre, and measuring with a protractor. • Use conventional markings for parallel lines and right angles.	• Draw 2D shapes and nets accurately using given dimensions and angles using measuring tools, conventional markings and labels for lines and angles.

Geometry: Angles				• Recognise angles as a property of shape or a description of a turn. • Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn. To identify whether angles are greater than or less than a right angle.	• Identify acute and obtuse angles and compare and order angles up to two right angles by size in preparation for using a protractor.	• Know angles are measured in degrees; estimate and compare acute, obtuse and reflex 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 $\frac{1}{2}$ a turn (total 180˚) -other multiples of 90˚ • Use the term diagonal and make conjectures about the angles formed between sides, and between diagonals and parallel sides. Use the properties of rectangles to deduce related facts and find missing lengths and angles by using angle sum facts and other properties to make deductions about missing angles and relate these to missing number problems.	• 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.

Position & Direction	EYFS	Key Stage One		Key Stage Two			
	Three and Four-Year Olds Reception Early Learning Goal	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Geometry: Position, Direction and Movement	• Understand position through words alone – for example, "The bag is under the table," – with no pointing. • Talk about and identify the patterns around them. For example, stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs', etc. • Extend and create ABAB patterns – stick, leaf, stick, leaf. • Notice and correct an error in a repeating pattern. • Draw information from a simple map. • Continue, copy and create repeating patterns.	• Describe position, direction and movement, including whole, half, quarter and three-quarter turns in both directions and connect clockwise with the movement on a clock face. • Use the language of position, direction and motion, including: left and right, top, middle and bottom, on top of, in front of, above, between, around, near, close and far, up and down, forwards and backwards, inside and outside.	• 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 three-quarter turns (clockwise and anticlockwise).		• Describe positions on a 2D grid as coordinates in the first quadrant. • Describe movements between positions as translations of a given unit to the left/right and up/down. • Read, write and use pairs of coordinates, including using coordinate plotting ICT tools. • Plot specified points and draw sides to complete a given polygon. • Draw a pair of axes in one quadrant, with equal scales and integer labels.	• Identify, describe and represent the position of a shape following a reflection (in lines that are parallel to the axes) or translation, using the appropriate language, and know that the shape has not changed.	• Draw and label a pair of axes in all four quadrants with equal scaling. • Describe positions on the full coordinate grid (all four quadrants). • Draw and label simple shapes – rectangles (including squares), parallelograms and rhombuses, specified by coordinates in the four quadrants, predicting missing coordinates using the properties of shapes. • Translate simple shapes, where coordinates may be expressed algebraically, on the coordinate plane and reflect them in the axes.

Statistics	EYFS	Key Stage One		Key Stage Two			
	Three and Four-Year Olds Reception Early Learning Goal	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Statistics: Record, present and interpret data	• Experiment with their own symbols and marks, as well as numerals.		• Record, interpret, collate, organise and compare information. • Interpret and construct simple pictograms, tally charts, block diagrams and simple tables (e.g. many-to-one correspondence in pictograms with simple ratios 2, 5, 10 scales).	• Interpret and present data using bar charts, pictograms and tables and use simple scales with increasing accuracy.	• Understand and use a greater range of scales in data representations. • Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.	• Begin to decide which representations of data are most appropriate and why. • Connect coordinates and scales to the interpretation of time graphs. • Complete, read and interpret information in tables, including timetables.	• Connect conversion from kilometres to miles in measurement to its graphical representation. • Connect work on angles, fractions and percentages to the interpretation of pie charts. • Interpret and construct pie charts and line graphs (relating to two variables) and use these to solve problems.

Statistics: Solve Problems			• 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.	• Solve one-step and two-step questions using information presented in scaled bar charts and pictograms and tables (e.g. How many more? How many fewer?).	• Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.	• Solve comparison, sum and difference problems using information presented in a line graph.	• Calculate and interpret the mean as an average. • Know when it is appropriate to find the mean of a data set.