Aylburton and English Bicknor Primary Schools
Maths Curriculum

Christian Vision and Values

'Through God's love we learn and flourish together' Corinthians 16:14

Thankfulness Perseverance Compassion Trust Courage Respect

Curriculum Drivers in Mathematics

World Aware – Children are encouraged to make links with the real world in Mathematics. Through applying their learning to reasoning and problem solving questions they are able to see how mathematics works in the real world.

Belonging – Whole year group teaching means it is extremely rare that children are taught outside of their age group. This allows children to discuss their maths learning which is a key part of developing correct mathematical vocabulary. Children use practical equipment with their talk partners for investigation activities.

Well-being – Children are encouraged through a 'can do' attitude towards maths. We focus on developing resilience and a growth mindset. We use mistakes as a learning tool in maths and children are always encouraged to have a go and explain their thinking. Small, progressive steps of learning help children to build on their knowledge across a unit of work and therefore experience success.

Spirituality – Children are encouraged to think about the wonderful world of maths. We look at number patterns as well as shape and repeating patterns as part of our learning in maths. This instils a sense of awe at how large numbers can be, how beautiful mathematical shape patterns are and more scientific concepts such as mass and capacity.

Possibilities – Maths opens up many possibilities in children's lives as a core subject which runs through all that we do. Reasoning and problem solving activities encourage children to spot patterns and find a solution. Children are encouraged to 'draw their way out' of a problem meaning they can solve anything through this method. We use a range of representations to show real-world problems that maths can be used to solve.

What we teach and why: Intent

Design, content and sequencing – The vision for maths across our schools embraces the aims of the national curriculum and promotes a 'can do' attitude. We strongly believe that ability is not fixed and everyone is able to and expected to achieve ARE. This belief is passed onto the children in our schools.

The mastery approach also instils in our staff that we do NOT label children as most / least able or can / can't do maths and the dynamics of the maths class can change daily. We see time and time again that children that would have previously not been exposed to maths of their year group are able to flourish in the mastery classroom.

Staff actively promote the 'Can do' attitude in maths and use the word 'yet' when children need to be reminded of this. We use mistakes as learning opportunities and develop and celebrate perseverance to help pupils overcome challenges. Pupils are encouraged to ask questions during teacher input and to explain and discuss their thinking with talk partners when faced with challenges. We value this depth of understanding over speed.

Teaching assistants are encouraged to work with children of all abilities depending on their need for a particular 'small step'.

Fluency, reasoning and problem solving tasks provide opportunities for ALL children to achieve which is the essential idea behind the 'teaching for mastery' in mathematics. The design of the tasks allows pupils to develop the depth and rigor they need to make secure and sustained progress over time. STEM sentences enable children to develop their mathematical vocabulary and encourage them to use this when reasoning.

We use White Rose maths resources to support teachers with planning for progression, skills and knowledge. White Rose Maths matches the National Curriculum closely, and breaks it down into small, manageable steps. The steps are carefully sequenced to ensure curriculum coverage and so that children build upon knowledge throughout the unit of work. There is also an emphasis on mathematical talk, and precise use of vocabulary and use of manipulatives.

Our school long term plans coincide with the White Rose overview to ensure curriculum coverage over the year. This provides teachers with termly mapping of units of work that are to be taught and the order in which to teach them. This ensures that there is consistency across the schools and that children acquire a sufficient grasp of mathematics relevant to their year group. We also use the White Rose calculation policy to ensure consistency of the four operations.

EYFS – During allocated maths time, EYFS children access the areas of the provision that relate directly to the ARE in maths. This approach allows teachers to go deeper into reasoning and conceptual understanding, continuous provision activities are available for the whole week for children to access and practise these skills. The focus on number helps them to make links with their understanding of the world around them and contextualises their learning.

KS1 and KS2 – Whole year group teaching fits the intent of our curriculum which ensures that every child has the right to learn at ARE. Children are taught in single year groups to allow each year group to access their ARE. At English Bicknor only, year 3 and 4 children work together for the teacher input but complete questions and work in their separate year groups. This is also the case for year 5 and 6 children at English Bicknor.

Maths across the curriculum
The importance of maths is emphasised across many of the foundation subjects we teach. This may be in Science when children measure the growth of plants, use bar charts to plot data, pictographs to represent data, using non-standard units to compare strength of magnets; DT when we weigh ingredients, calculate times for cooking, measuring length for bridges; History such as chronology of events in Victorian Britain; Geography line graphs and bar charts to compare temperature, rainfall and daylight hours between countries; Art when we explore patterns , symmetry and so on. This ensures that links are not tenuous and that skills are practised across the foundation subjects.

How it's taught: Implementation

Strategies are used routinely by teachers to enable the children to embed their learning into their long-term memory. These strategies come from Rosenshine's Principles of Instruction such as daily reviews, low stakes quizzing, interleaving and annotated visual representations of information.

We use active learning techniques which teachers employ in the classroom to complement learning and give all children the opportunity to become actively engaged and to articulate their understanding. We aim to keep the learning pace of all children at the highest level and ensure there is no 'glass ceiling' for any learner.

The maths curriculum is delivered using the National Curriculum 2014 and the Early Years Foundation Stage (Sept 2021). These are followed to ensure continuity from the Foundation Stage through to KS1 and KS2.

EYFS (Mathematics is a specific area)

- Match, sort and compare
- Talk about measure and patterns
- It's me 1, 2, 3
- Circles and triangles
- 1, 2, 3, 4, 5
- Shapes with 4 sides
- Alive in 5
- Mass and capacity
- Growing 6, 7, 8
- Length, height and time
- Building 9 and 10
- Explore 3-D shapes
- To 20 and beyond
- How many now?
- Manipulate, compose and decompose
- Sharing and grouping
- Visualise, build and map
- Make connections

At KS1 children's learning will be structured with the following topics:

- Number and place value
- Addition and subtraction
- Multiplication and division

. Fractions
. Measurement
. Geometry – properties of shapes
. Geometry – position and direction
. Statistics (Year 2)

At Lower KS2 the children will follow the topics above, whilst perimeter and area are introduced from Year 3 and decimals are introduced in Year 4.

In Upper KS2 the programme of study is as follows:
. Number and place value
. Addition, subtraction, multiplication and division
. Fractions, decimals and percentages
. Ratio and proportion – Year 6
. Algebra – Year 6
. Measurement
. Geometry – properties of shapes
. Geometry – position and direction
. Statistics

Staff use White Rose Maths scheme of work, which develops fluency, reasoning and problem solving to support the planning of lessons. Teachers can supplement the White Rose Maths resources with other materials particularly the NCETM mastery PD resources, numicon and Nrich teaching resources. We focus on the use of practical resources for all children to support our mastery approach to mathematics.

All lessons have a key learning point which focuses on small steps within the unit of work so as each lesson builds on the prior knowledge of children. We focus on maths vocabulary and the use of STEM sentences so as children can apply their learning to different contexts.

All lessons start with sharing the learning point so that children know what they are learning about. Each lesson in KS2 is made up of two parts: a focus teach with the class teacher and independent practise of the learning point which consists of three main parts - fluency, reasoning and problem solving: the majority of this independent practise takes place in White Rose Workbooks. Children have access to practical resources throughout the lesson to support their understanding and demonstrate their understanding.

A teaching for mastery approach is used across our schools in order to work towards the National Curriculum aims. The key elements for a mastery approach are:
. Belief that all pupils are able to understand and do maths, given sufficient time. With good teaching, appropriate resources, effort and a ‘can do’ attitude, all children can enjoy and achieve in maths.
. Pupils are taught through whole year group interactive teaching where the focus is on all pupils working together on the same lesson content at the same time. This aim is to ensure that all can master concepts before moving on to the next part of the curriculum sequence.

. If a pupil is unable to grasp a concept, this is identified quickly and 'mop up' takes place to ensure the pupil is able to move on with the whole class in the next lesson. Where it is recognised that the gap is too wide to solve through the 'mop up' process, an intervention is implemented to try to close the gap.
. Procedural fluency and conceptual understanding are developed together because each supports the development of the other.
. It is recognised that practice is a vital part of learning, but the practice used is intelligent practice that both reinforces pupils' procedural fluency and develops their conceptual understanding.
. Significant time is spent developing deep knowledge of the key ideas that are needed to underpin future learning. The structure and connections within the mathematics are emphasised, so that pupils' deep learning can be sustained.

Planning a coherent journey
Effective planning for mastery should involve the planner to think deeply about the steps needed to be taken to enable all pupils to succeed and meet objectives. Planning should ensure that the teacher is confident in the delivery of content as it has been well thought out. This will often take the form of small steps taken from the White Rose Scheme of work.

In a typical lesson, the teacher leads a back and forth interaction, including questioning, short tasks, explanation, demonstration and discussion. Teachers take a scaffolded approach by demonstrating first 'I do', then working together with the children 'We do' and finally allowing the children to work on their own 'You do'.

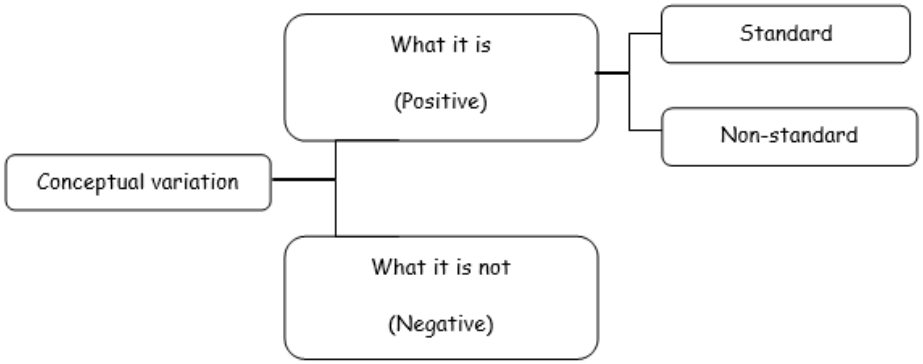
At English Bicknor, we use our school long term plan, which is based on the White Rose overview. We also use White Rose to identify the small steps within each unit that may be appropriate for the children in our class.

Representation and structure
A skill of the teacher is to be able to represent the maths in a way which provides and insight for the children. Concrete materials, different contexts, drawings, diagrams and equations all play a role. These are discussed through opportunities for pupil and pupil- teacher talk, to develop reasoning, flexibility and adaptability in mathematical thinking. Representation, used well, enables pupils to develop an internal representation. Again, teachers use representations from White Rose to support this.

Variation- Conceptual and procedural
Variation theory has several dimensions including use of multiple representations of what a concept is, and what it is not. It is characterised by carefully constructed small steps through the learning, paying attention to what is kept the same and what changes. This is so as children can reason, make connections and build deep conceptual knowledge. Variation is applied to practice questions where attention is paid to the selection and order of the examples, often changing just one aspect but keeping the others the same. The intention is to avoid mechanical repetition but instead to promote thinking to make connections. This is also known as 'intelligent practise'.
e.g. LP: Multiply 2 digit numbers by 10
Fluency- 2 x 10 =
20 x 10 =
6 x 10 =
26 x 10 =

<u>Conceptual variation:</u>

Provides the opportunity to work on different representations for the same mathematical idea or can be the same mathematical idea- different problem.



Procedural variation

Provides the opportunity:

- For practise (intelligent rather than mechanical)
- To focus on relationships, not just the procedure
- To make connections between problems
- To use one problem to work out the next
- To create other examples of their own

Types of procedural variation include:

- Varying example to exposure and underlying structure to the concept
- Same method, different problem
- Same problem, different method

Stem sentences and generalised statements

Teaching children precise mathematical language and insisting upon its use, supports children's ability to think about the concept. Stem sentence structures often express conceptual ideas and provide a framework to embed conceptual knowledge and build understanding. These should be referred to throughout the lesson. Children may be asked if they could write a stem sentence at the end of the lesson.

Fluency

This is more than memorisation of procedures. Computational fluency has been defined as the ability to carry out mathematical computations 'efficiently, accurately and flexibly' (Russell, 2000).

Efficiency implies that the student does not get bogged down in too many steps or lose track of the logic of the strategy. An efficient strategy is one that the student can carry out easily, keeping track of sub problems and making use of intermediate results to solve the problem.

Accuracy depends on several aspects of the problem solving process, among them careful recording, knowledge of number facts and other important number relationships.

Flexibility requires the knowledge of the problem solving process. The careful recording of number facts and other important number relationships.

Reasoning

Careful planning of questioning and activity design is needed to develop reasoning. We use White Rose lesson design. This includes:

- Odd one out
- What's the same or different
- Convince me
- Always, sometimes, never
- Give me another example, and another…
- Spot the mistake
- True or false

Problem solving

A variety of problem solving skills are considered and planned for as part of each lesson. White Rose, NCETM and Nrich are used to find tasks that are appropriate to the key learning point. These may include

- Working systematically
- Trial and improvement
- Logical reasoning
- Spotting patterns
- Visualising
- Working backwards

The Maths curriculum is planned and implemented using the mastery approach so that pupils' learning and achievement is not limited. Pupils are set three tasks each lesson: Fluency, reasoning and problem solving. The teacher uses formative assessment in the lesson to determine which pupils need additional support for each small step in learning. These children are identified within the lesson and are supported with 1:1 or small group input. Similarly, children who grasp the 'small step' rapidly are encouraged to deepen their understanding through the problem solving challenges and/or by explaining their understanding using C/P/A representations.

Intervention:

Throughout the school we use formative assessment within lessons to teach 1:1 or small groups of children who require extra support.

Where children are identified as needing further intervention they spend some intervention time with a TA or teacher to ensure they meet the small steps necessary in order for them to be able to engage with their year group expectations. In some instances, children are given work that has been adapted to match their individual needs but this is not used to replace year group teaching completely.
Where children have a specific difficulty with mathematics, NumberStacks intervention is used to systematically cover the basic foundations of number and guide children towards maths techniques. Again, this is used in addition to, not as a replacement for the year group specific teaching that all children are exposed to.
In some circumstances, children may follow a previous year group long term plan and teaching resources in maths. This is a very rare occurrence and all other avenues should be tried before this takes place.
We recognise that all maths teachers are SEND maths teachers and we plan for and deliver inclusive maths lessons, using manipulatives, scaffolds, questioning and support where appropriate to enable all students to access the learning and to achieve.

What we see as a result: Impact

Raising self-esteem/self-confidence – Whole year group teaching ensures that all children work together and have the opportunity to thrive and learn from one another. Children are encouraged to take on challenges, question and explain their mathematical understanding. We celebrate perseverance and learn from mistakes and common misconceptions. We support children using varied representations and intervention within the lesson. Children are challenged through questioning, by explaining their reasoning and through applying their learning to problem solving questions.

Focus on the core skills of reading/writing/maths – Maths is a school priority. We use Flashback 4 sessions to recap learning that is based on times tables, telling the time and a recap of the four operations to ensure children retain these core elements of maths.

Developing speech and language – KS2 children and KS1 where appropriate, are challenged to answer reasoning questions in full sentences, often using STEM sentences for support. There is a focus on precise mathematical vocabulary which is used to support children's depth of knowledge, Children are also expected to use mathematical vocabulary correctly. Spelling errors are identified in maths books as appropriate.

Raise aspirations and set high expectations – Whole class teaching ensures all children are exposed to ARE and therefore there is no cap on learning. Children are challenged to complete problem solving for each small step. Our planned small steps allow all children to achieve in maths as we are able to pick up on misconceptions quickly. This ensures that children can become successful mathematicians.

Develop life skills/social skills – Mathematics is a core skill for learning in our schools. Children are encouraged to work together to discuss their understanding, to explain their reasoning and problem solving. We focus on learning life skills such as times tables, telling the time and the four operations.

Place value	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Counting	• Count beyond ten.	• 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 • count forwards and backwards with positive and negative whole numbers, including through zero	
Represent number	•Subitise • Link the number symbol (numeral) with its cardinal number value.	• identify and represent numbers using objects and pictorial representations • read and write numbers to 100 in numerals • read and write numbers from 1 to 20 in numerals and words	• 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 • 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, 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, write, (order and compare) numbers up to 10 000 000 and determine the value of each digit
Use and compare	• Count objects, actions and sounds. • Compare numbers.	• given a number, identify one more and one less	• recognise the place value of each digit in a two-digit number (tens, ones) • compare and order numbers from 0 up to 100; use < > and = signs	• recognise the place value of each digit in a three-digit number (hundreds, tens, ones) • compare and order numbers up to 1000	• find 1000 more or less than a given number • recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) • order and compare numbers beyond 1000	• (read, write) order and compare numbers to at least 1 000 000 and determine the value of each digit	• (read, write), order and compare numbers up to 10 000 000 and determine the value of each digit

Problem solving/ Rounding			• use place value and number facts to solve problems	• solve number problems and practical problems involving these ideas	• round any number to the nearest 10, 100 or 1000 • solve number and practical problems that involve all of the above and with increasingly large positive numbers	• interpret negative numbers in context • round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 • solve number problems and practical problems that involve all of the above	• round any whole number to a required degree of accuracy • use negative numbers in context, and calculate intervals across zero • solve number and practical problems that involve all of the above

Addition, subtraction	*Reception*	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Year 6*
Calculations	• Understand the 'one more than/one less than' relationship between consecutive numbers. • Explore the composition of numbers to 10. • Automatically recall number bonds for numbers 0-5 and some to 10.	• add and subtract one-digit and two-digit numbers to 20, including zero	• 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 • add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	• add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	• add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • add and subtract numbers mentally with increasingly large numbers	• 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

Problem solving		• solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ – 9	• solve problems with addition and subtraction: ➢ using concrete objects and pictorial representations, including those involving numbers, quantities and measures ➢ applying their increasing knowledge of mental and written methods	• solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	• solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	• 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	• solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

Multiplication, division	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Year 6*
Recall/ use		• 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 multiplication and division facts for multiplication tables up to 12 × 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)	• 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
Calculations		• calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs	• write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods	• multiply two-digit and three-digit numbers by a one-digit number using formal written layout	• multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for twodigit numbers • 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 remainders according to the context • perform mental calculations, including with mixed operations and large numbers	• multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • 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

Problem Solving	• 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, 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 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
Combined					• solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	• use their knowledge of the order of operations to carry out calculations involving the four operations

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Fractions	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Recognise and write	• recognise, find and name a half as one of two equal parts of an object, shape or quantity • recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators	• recognise, find, name and write fractions 1 3 , 1 4 , 2 4 and 3 4 of a length, shape, set of objects or quantity	• recognise, find and name a quarter as one of four equal parts of an object, shape or quantity • 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	• count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.	• 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 [for example, 2/5 + 4/5 = 6/5 = 1 1/5	
Compare		• Recognise the equivalence of 2/4 and 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 equivalent 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 • compare and order fractions, including fractions > 1
Calculations		• write simple fractions for example, 1/2 of 6 = 3	• add and subtract fractions with the same denominator within one whole [for example, 5/7 + 1/7 = 6/7]	• add and subtract fractions with the same denominator	• add and subtract fractions with the same denominator and denominators that are multiples of the same number • 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 [for example,1/4 × 1/2 = 1/8] • divide proper fractions by whole numbers [for example 1/3 ÷ 2 = 1/6]
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		

Decimals	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Recognise, write, compare				• recognise and write decimal equivalents of any number of tenths or hundredths • recognise and write decimal equivalents to 1/4 , 1/2 , 3/4 • 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	• read and write decimal numbers as fractions [for example, 0.71 = 71/100] • recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • 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	• identify the value of each digit in numbers given to three decimal places

FDP	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				• solve simple measure and money problems involving fractions and decimals to two decimal places	• recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal • solve problems which require knowing 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	• associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3 8] • recall and use equivalences between simple fractions, decimals and percentages, including in different contexts

Through God's love, we learn and flourish together.

Ratio and Proportion	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Year 6*
						• 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/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	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Year 6*
	Note – although formal algebraic notation is not introduced until Y6, algebraic thinking starts much earlier as exemplified by the 'missing number' objectives from Y1/2/3					• 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	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Using measures	• Compare length, weight and capacity.	• compare, describe and solve practical problems for: ➢ 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 [for example, kilometre to metre; hour to minute] •estimate, compare and calculate different measures	• convert between different units of metric measure •understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints •use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling	• solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 d.p. 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 3 d.p. • convert between miles and kilometres
Money		• recognise and know the value of different denominations of coins and notes	• 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	• add and subtract amounts of money 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 [for example, money]	

Time		• sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and 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	• 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	• 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	• 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
Perimeter, area, volume				•measure the perimeter of simple 2-D shapes	•measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres • find the area of rectilinear shapes by counting squares	•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	• 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

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						•estimate volume [for example, using blocks to build cuboids] and capacity [for example, using water]	using standard units, including cubic centimetres (cm3) and cubic metres (m3), and extending to other units

Geometry	*Reception*	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Year 6*
2D Shapes	• Select, rotate and manipulate shapes in order to develop spatial reasoning skills. • Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can. • Continue, copy and create repeating patterns.	• recognise and name common 2- D shapes [for example, rectangles (including squares), circles and triangles]	• identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line • identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] • compare and sort common 2-D shapes and everyday objects	•draw 2-D shapes	• compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes • identify lines of symmetry in 2-D 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	•draw 2-D 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
3D Shapes	• Select, rotate and manipulate shapes in order to develop spatial reasoning skills.	• recognise and name common 3- D shapes [for example, cuboids (including cubes), pyramids and spheres]	• recognise and name common 3- D shapes [for example, cuboids (including cubes), pyramids and spheres] • compare and sort common 3-D shapes and everyday objects	•make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them		• identify 3-D shapes, including cubes and other cuboids, from 2- D representations	• recognise, describe and build simple 3-D shapes, including making nets

Angels and lines				• 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; identify whether angles are greater than or less than a right angle • identify horizontal and vertical lines and pairs of perpendicular and parallel lines	• identify acute and obtuse angles and compare and order angles up to two right angles by size • 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	• 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 1 2 a turn (total 180°) ➢ other multiples of 90°	• 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 and direction		• describe position,	• order and arrange combinations of		• describe positions on a 2-D grid as	• identify, describe and represent the position of	• describe positions on the full coordinate

		direction and movement, including whole, half, quarter and three-quarter turns	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)		coordinates in the first quadrant • describe movements between positions as translations of a given unit to the left/right and up/down • plot specified points and draw sides to complete a given polygon	a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed	grid (all four quadrants) •draw and translate simple shapes on the coordinate plane, and reflect them in the axes

Statistics	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Year 6*
Present and interpret data		• interpret and construct simple pictograms, tally charts, block diagrams and simple tables	• interpret and present data using bar charts, pictograms and tables	• interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	• complete, read and interpret information in tables, including timetables	• interpret and construct pie charts and line graphs and use these to solve problems
Solve statistical 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 [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables	• 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

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