

## Year 5

### Mathematics Medium Term Plan:

#### Our Rainbow Promises:

Encourage **Resilience** and perseverance  
 Develop **Articulate** learners  
 Influence aspirations  
 Nurture curiosity  
 Instil **British** and Christian Values  
 Provide **Opportunities** to build upon knowledge and skills  
 Promote **Wellbeing** and Health

R	Strategies for developing metacognition woven throughout the mathematics curriculum. Inclusive approach to lessons - "keep up with new content", as opposed to having to "catch up" for all learners.
A	Use of STEM sentence starters and progressive vital vocabulary woven into all lessons and clearly displayed on working wall. Extensive opportunities to reason and discuss problems within journaling.
I	Mathematical careers discussed; Deepening Understanding Maths Club; and Money Mentors in Y4/Y5/Y6. Utilise 'assessment as learning' to develop and support children's metacognitive skills - empowers a growth mindset where children can see their maths ability as something that can change and improve.
N	Child led learning as a feature of the three-part lesson - children to articulate their own understanding and methods.
B	British Values (Rule of Law and Mutual Respect). Christian Values (Courage and endurance). SMSC woven throughout
O	Subject planning and delivery sequenced through a spiral curriculum with extensive retrieval opportunities built around Rainbow Promises. Development of computational thinking; building on learning in Computing curriculum.
W	Curriculum Content including Money Mentors. Application of Mathematics to real life contexts.

#### Curriculum Intent:

At Parish Church of England Primary school, we provide a high-quality mathematics education utilising a mastery approach so that all children: become fluent in the fundamentals of mathematics; are able to reason mathematically with increasing articulacy; and can solve problems by applying their understanding to a variety of problems. Our inclusive mathematics curriculum provides challenge for all pupils with teachers choosing to progress to new learning only when the majority of learners have a secure understanding. Challenge occurs through depth of understanding with an offer of rich and sophisticated problems rather than new content. Our mathematics curriculum aims to develop the five core mathematical competencies in all of our learners - therefore providing a foundation for our children to understand the world around them knowing both the beauty and power of mathematics in its own right and how it can be applied to other subjects across the curriculum including Science and Computing.

#### Programme of Learning:

At Parish Church of England Primary School, our mathematics planning from Reception through to Year 6 is informed (not dictated) by use of Maths-No Problem! - a high-quality mastery scheme of work setting high aspirations for all children, ensuring that all pupils can "keep up with new content", as opposed to having to "catch up" - particularly after periods of remote learning. Maths - No Problem! provides a series of carefully sequenced lessons enabling new knowledge and skills to be built upon what has been previously taught; and pupils can work towards clearly defined end points. However, our highly skilled teachers are then able to reflect and adapt the teaching sequence appropriately (dependent on pupil's knowledge) to provide further opportunities for practice, consolidation and an increasing depth of conceptual understanding. The sequence and speed of lesson delivery is dictated by pupil understanding with whitespace lessons and prioritisation of 'key lessons' utilised where appropriate to embed the most fundamental concepts. This ensures that all statutory National Curriculum coverage is met, with additional coverage of deeper non-statutory content if time allows. 'Fluency Friday' (supporting the discrete teaching of multiplication tables) also takes place from Y1-Y6 providing students with an opportunity to recall prior learning and time to practice their key skills so they remain sharp and so they can retrieve information they've learned when needed.

#### Lesson Structure:

Lesson Parts	Lesson Features	Five Core Competencies Demonstrated by Learners Throughout A Lesson
Anchor Task (30 minutes)	Lesson opens with a potential real-life problem called an anchor task, which develops children's reading skills. Pupils tackle the problem, utilising concrete, pictorial, abstract approach. Record ideas in journaling after extensive opportunities for exploration and discussion.	<b>Visualisation</b> ask learners to show "how they know" at every stage of solving the problem. <b>Generalisation</b> challenge learners to dig deeper by finding proof.
Guided Practise (10 minutes)	With the methodology discussed, the children then used this learning in the Guided Practice section. Working through the problems together, children continue to talk to each other and share ideas.	<b>Communication</b> encourage learners to answer in full sentences. Try asking learners to talk about the work they're doing or use structured tasks centred around a class discussion. <b>Number sense</b> a learner's ability to work fluidly and flexibly with numbers.
Independent Practise (15 minutes)	For the final part of the lesson, children complete the independent practice section of the workbook individually. Initially, the workbook questions are scaffolded. However, as pupils work through them, the scaffolding is reduced and the questions gradually become more challenging.	<b>Metacognition</b> teach learners to think about how they are thinking. This helps learners solve multi-step tasks and promotes the ability to keep complex information in mind.

#### Our Prioritisation of Key Learning:

##### Maths - No Problem! Lesson Prioritisation:

KEY LESSON	★ ★	• is a key lesson
COMBINED	⌂ ⌂	• can be combined with other lessons in the chapter
INTEGRATED	➤ ➤	• can be integrated with lessons from other year groups
INDEPENDENT	■ ■	• can be tackled independently
NON-STATUTORY	● ●	• non statutory
IF TIME ALLOWS	⌘ ⌘	• if time allows

Staff utilise Maths - No Problem! online for the short-term planning to analyse lesson prioritisation, potential methods, and teaching sequence.

##### NCETM Ready-to-progress Criteria Strands:

Ready-to-progress criteria strands	Code
Number and place value	NPV
Number facts	NF
Addition and subtraction	AS
Multiplication and division	MD
Fractions	F
Geometry	G

Summary of criteria provided within MT plan alongside focus 'ready-to-progress criteria' per unit of work. All teaching staff provided with full guidance to inform teaching strategy on a day-to-day basis.

# Coverage of Mathematics in Year 5:

## Fluency

Fluency Friday takes place once per week to provide additional fluency practise (that will develop accuracy, flexibility and appropriate response, efficiency, automaticity, and number sense) alongside the discrete teaching of multiplication tables. This is also supported by retrieval time daily across school each morning.

Numbers to  
1,000,000  
(3 weeks).

Whole Numbers:  
Addition and  
Subtraction  
(3 weeks)

Roman  
Numerals  
(1 week)

Whole Numbers:  
Multiplication  
and Division  
(6 weeks).

Whole Numbers:  
Word Problems  
(1 week)

Geometry  
(2 weeks)

Percentages  
(1 week)

Decimals  
(3 weeks)

Fractions  
(4 weeks)

Graphs  
(2 weeks).

Position and  
Movement  
(1 week)

Measurements  
(4 weeks)

Area and  
Perimeter  
(3 weeks)

Volume.  
(2 weeks).

Consolidation  
of all times  
tables  
throughout the  
academic year.

## Long-Term Knowledge Retention:

In addition to the natural spiral curriculum embedded within Maths - No Problem, ready to progress statements are prioritised as long-term knowledge focus that all learners must achieve to move to their next stage of learning.



# Ready-To-Progress Criteria Summary: Year 1 to Year 6

Strand	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
NPV	<b>1NPV-1</b> Count within 100, forwards and backwards, starting with any number.		<b>3NPV-1</b> Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three-digit multiples of 10.	<b>4NPV-1</b> Know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100; apply this to identify and work out how many 100s there are in other four-digit multiples of 100.	<b>5NPV-1</b> Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1. Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01. Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01.	<b>6NPV-1</b> Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000).
		<b>2NPV-1</b> Recognise the place value of each digit in two-digit numbers, and compose and decompose two-digit numbers using standard and non-standard partitioning.	<b>3NPV-2</b> Recognise the place value of each digit in <i>three</i> -digit numbers, and compose and decompose <i>three</i> -digit numbers using standard and non-standard partitioning.	<b>4NPV-2</b> Recognise the place value of each digit in <i>four</i> -digit numbers, and compose and decompose <i>four</i> -digit numbers using standard and non-standard partitioning.	<b>5NPV-2</b> Recognise the place value of each digit in numbers with up to 2 decimal places, and compose and decompose numbers with up to 2 decimal places using standard and non-standard partitioning.	<b>6NPV-2</b> Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning.
	<b>1NPV-2</b> Reason about the location of numbers to 20 within the linear number system, including comparing using < > and =	<b>2NPV-2</b> Reason about the location of any two-digit number in the linear number system, including identifying the previous and next multiple of 10.	<b>3NPV-3</b> Reason about the location of any <i>three</i> -digit number in the linear number system, including identifying the previous and next multiple of 100 and 10.	<b>4NPV-3</b> Reason about the location of any <i>four</i> -digit number in the linear number system, including identifying the previous and next multiple of 1,000 and 100, and rounding to the nearest of each.	<b>5NPV-3</b> Reason about the location of any number with up to 2 decimals places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each.	<b>6NPV-3</b> Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts.

# Ready-To-Progress Criteria Summary: Year 1 to Year 6

Strand	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
NPV			<b>3NPV-4</b> Divide 100 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal parts. →	<b>4NPV-4</b> Divide 1,000 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 1,000 with 2, 4, 5 and 10 equal parts. →	<b>5NPV-4</b> Divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 2, 4, 5 and 10 equal parts. →	<b>6NPV-4</b> Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.
					<b>5NPV-5</b> Convert between units of measure, including using common decimals and fractions.	
NF	<b>1NF-1</b> Develop fluency in addition and subtraction facts within 10. →	<b>2NF-1</b> Secure fluency in addition and subtraction facts within 10, through continued practice. →	<b>3NF-1</b> Secure fluency in addition and subtraction facts that bridge 10, through continued practice.			
	<b>1NF-2</b> Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any multiple, and count forwards and backwards through the odd numbers. →		<b>3NF-2</b> Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number. →	<b>4NF-1</b> Recall multiplication and division facts up to $12 \times 12$ , and recognise products in multiplication tables as multiples of the corresponding number. →	<b>5NF-1</b> Secure fluency in multiplication table facts, and corresponding division facts, through continued practice.	
				<b>4NF-2</b> Solve division problems, with two-digit dividends and one-digit divisors, that involve remainders, and interpret remainders appropriately according to the context.		
			<b>3NF-3</b> Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10). →	<b>4NF-3</b> Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 100). →	<b>5NF-2</b> Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth).	

# Ready-To-Progress Criteria Summary: Year 1 to Year 6

Strand	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
AS	<b>1AS-1</b> Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers.	<b>2AS-1</b> Add and subtract across 10.	<b>3AS-1</b> Calculate complements to 100.			<b>6AS/MD-1</b> Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).
	<b>1AS-2</b> Read, write and interpret equations containing addition (+), subtraction (−) and equals (=) symbols, and relate additive expressions and equations to real-life contexts.	<b>2AS-2</b> Recognise the subtraction structure of 'difference' and answer questions of the form, "How many more...?".	<b>3AS-2</b> Add and subtract up to three-digit numbers using columnar methods.			<b>6AS/MD-2</b> Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.
		<b>2AS-3</b> Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract only ones or only tens to/from a two-digit number.	<b>3AS-3</b> Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction, and how both relate to the part-part-whole structure. Understand and use the commutative property of addition, and understand the related property for subtraction.			<b>6AS/MD-3</b> Solve problems involving ratio relationships.
		<b>2AS-4</b> Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract any 2 two-digit numbers.				<b>6AS/MD-4</b> Solve problems with 2 unknowns.

# Ready-To-Progress Criteria Summary: Year 1 to Year 6

Strand	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
MD		<u>2MD-1</u> Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2, 5 and 10 multiplication tables.	<u>3MD-1</u> Apply known multiplication and division facts to solve contextual problems with different structures, including quotitive and partitive division.	<u>4MD-1</u> Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size. →	<u>5MD-1</u> Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size.	For year 6, MD ready-to-progress criteria are combined with AS ready-to-progress criteria (please see above).
		<u>2MD-2</u> Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotitive division).		<u>4MD-2</u> Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication.	<u>5MD-2</u> Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.	
				<u>4MD-3</u> Understand and apply the distributive property of multiplication. →	<u>5MD-3</u> Multiply any whole number with up to 4 digits by any one-digit number using a formal written method.	
					<u>5MD-4</u> Divide a number with up to 4 digits by a one-digit number using a formal written method, and interpret remainders appropriately for the context.	

# Ready-To-Progress Criteria Summary: Year 1 to Year 6

Strand	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
F			<b>3F-1</b> Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts.			<b>6F-1</b> Recognise when fractions can be simplified, and use common factors to simplify fractions.
			<b>3F-2</b> Find unit fractions of quantities using known division facts (multiplication tables fluency). →		<b>5F-1</b> Find non-unit fractions of quantities.	<b>6F-2</b> Express fractions in a common denominator and use this to compare fractions that are similar in value.
			<b>3F-3</b> Reason about the location of any fraction within 1 in the linear number system. →	<b>4F-1</b> Reason about the location of mixed numbers in the linear number system.		<b>6F-3</b> Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denominator as a comparison strategy.
				<b>4F-2</b> Convert mixed numbers to improper fractions and vice versa.	<b>5F-2</b> Find equivalent fractions and understand that they have the same value and the same position in the linear number system.	
			<b>3F-4</b> Add and subtract fractions with the same denominator, within 1. →	<b>4F-3</b> Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers.	<b>5F-3</b> Recall decimal fraction equivalents for $\frac{1}{2}$ , $\frac{1}{4}$ , $\frac{1}{5}$ and $\frac{1}{10}$ , and for multiples of these proper fractions.	
G	<b>1G-1</b> Recognise common 2D and 3D shapes presented in different orientations, and know that rectangles, triangles, cuboids and pyramids are not always similar to one another. →	<b>2G-1</b> Use precise language to describe the properties of 2D and 3D shapes, and compare shapes by reasoning about similarities and differences in properties. →	<b>3G-1</b> Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations.		<b>5G-1</b> Compare angles, estimate and measure angles in degrees (°) and draw angles of a given size.	

# Ready-To-Progress Criteria Summary: Year 1 to Year 6

Strand	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
G					<b>5G-2</b> Compare areas and calculate the area of rectangles (including squares) using standard units.	
	<b>1G-2</b> Compose 2D and 3D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations. →		<b>3G-2</b> Draw polygons by joining marked points, and identify parallel and perpendicular sides. →	<b>4G-1</b> Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant. →		<b>6G-1</b> Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.
				<b>4G-2</b> Identify regular polygons, including equilateral triangles and squares, as those in which the side-lengths are equal and the angles are equal. Find the perimeter of regular and irregular polygons.		
				<b>4G-3</b> Identify line symmetry in 2D shapes presented in different orientations. Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry.		

Unit 1: Numbers to 1,000,000 (12 lessons - 3 weeks) (Autumn 1).		Unit 2: Whole Numbers: Add. and Sub. (10 lessons - 3 weeks) (Autumn 1).		Unit 14: Roman Numerals (2 lessons - 1 week) (Autumn 1).	
<u>Progress in Learning:</u> In this chapter, pupils will be looking at numbers and their place value to 1 000 000. The chapter begins reviewing how to read and write numbers to 100 000, quickly moving onto numbers to 1 000 000. Time is spent using concrete materials to represent numbers to 1 000 000, including number discs and place-value charts. Pupils then compare numbers to 1 000 000 using their knowledge of place value in addition to bar model supports to assist them. Pupils complete the unit by making number patterns and rounding numbers to the nearest 10, 1000, 10 000 and 100 000.		<u>Progress in Learning:</u> In this unit, pupils will be exploring addition and subtraction of numbers to 1 000 000. They will begin the unit by using simple strategies to add and subtract, such as counting on and counting back. They will then focus on adding within 1 000 000 and subtracting within 1 000 000. Pupils will use multiple key methods, such as the column method and number bonds to add and subtract numbers. Pupils will have access to concrete materials throughout the unit, improving their visualisation and mental skills. The unit ends with consolidation activities with number cards, putting pupils' knowledge and understanding into practice.		<u>Progress in Learning:</u> In this short chapter, pupils are identifying and using Roman numerals. In the first lesson, pupils learn to write Roman numerals to 1000, determining rules to apply to the written number. In the second lesson, pupils learn how to write years above 1000. The chapter ends with applying knowledge of Roman numerals to real-life scenarios.	
<u>N.C Objectives:</u> Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit. Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000. Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.		<u>N.C Objectives:</u> Add and subtract whole numbers with more than 4 digits. Add and subtract numbers mentally with increasingly large numbers. Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy. Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction).		<u>N.C Objectives:</u> Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	
<u>Ready to Progress Statements (Key Learning):</u> N/A		<u>Ready to Progress Statements (Key Learning):</u> N/A		<u>Ready to Progress Statements (Key Learning):</u> N/A	
<u>Teaching Resources:</u> Place-value charts (between two) Place-value discs (between two) 1-9 digit cards (each)		<u>Teaching Resources:</u> Place-value discs (between two) 1-9 digit cards (between two)		<u>Teaching Resources:</u> /	
<u>Revisited Vital Vocabulary/ New Vital Vocabulary:</u> Equal to, Ones, tens, hundreds, place value, thousands, multiple, number patterns, greater than, smaller than, numbers to 10,000 in numbers/words, 1000 less, 1000 more, rounding, estimate, approximation, ascending, descending, tens of thousands, hundreds of thousands,		<u>Revisited Vital Vocabulary/ New Vital Vocabulary:</u> add, counting on, difference in greater, in total, minus, subtract, altogether, equals, partitioning, column method, renaming, double, addend, subtrahend, bar-model, rounding, approximate, tens thousands, hundreds of thousands, million,		<u>Revisited Vital Vocabulary/ New Vital Vocabulary:</u> Roman Numerals	
<u>Sentence Starters:</u> (Lesson specific language also online). The ____ has a value of ____ or ____. It is in the ____ place. ____ is greater than ____. ____ is less than ____. ____ is ( more than / greater than ) ____. X is ____ less than X. [48  003] is closer to ____ than ____. [48  003] is approximately equal to _____.		<u>Sentence Starters:</u> (Lesson specific language also online). I can count on 20 000 in 10 000s. 36 541, ...	The approximate total number was _____. The actual number was _____. The difference was...	<u>Sentence Starters:</u> (Lesson specific language also online). [Roman numeral] stands for ____. The Roman numeral ____ represents ____. [year in Roman numerals] is ____. This Roman numeral indicates the year _____.	

Unit 3: Whole Numbers: Mult. And Div. (19 lessons - 6 weeks) (Autumn 2).		Unit 4: Whole Numbers: Word Problems (4 lessons - 1 week) (Autumn 2).		Unit 5: Graphs (7 lessons - 2 weeks) (Spring 1).	
<u>Progress in Learning:</u> In this unit, pupils are multiplying and dividing 3- and 4-digit numbers by single- and double-digit numbers. The unit begins by finding and defining multiples and factors and common factors. Pupils begin to work with prime numbers and determine what makes a number prime or composite. After this, they work with square and cube numbers before moving on to multiplying by 10, 100 and 1000. When multiplying, pupils are encouraged to use a variety of methods, including number bonds, column methods and the grid method. Number bonds are used to represent multiplicative word problems. Pupils then move on to multiply by 2-digit numbers before beginning to divide by 10, 100 and 1000. The unit ends as pupils learn to divide, giving rise to remainders using multiple methods, including number bonds and long and short division.		<u>Progress in Learning:</u> In this chapter, pupils are solving word problems that involve multiple steps and a variety of operations. Pupils begin the unit by simply choosing the correct operation before moving onto representing the key information using bar models. Applying the strategies learned in previous units is key in solving the challenges. The chapter ends with complex representations of numbers and change using advanced bar models.		<u>Progress in Learning:</u> In this chapter, pupils read and interpret information in tables and line graphs. The first lesson requires pupils to read and interpret information presented in a table showing flights between Singapore and London. In the next lesson, they are required to use the data to answer questions, however the data has restrictions and must be sorted. The final lesson on tables leaves out key information, such as omitting a train time to indicate the train does not stop at a specific station. Then there are four lessons on line graphs, beginning with a single line to represent a given set of data, followed by constructing line graphs that have more than one data set to represent.	
<u>N.C Objectives:</u> 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. Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. Recognise and use square numbers and cube numbers, and the notation for squared <sup>2</sup> and cubed <sup>3</sup> . Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. Multiply and divide numbers mentally drawing upon known facts. Multiply numbers up to 4 digits by a 1- or 2-digit number using a formal written method, including long multiplication for 2-digit numbers. Solve problems involving multiplication. Multiply and divide numbers mentally drawing upon known facts. Divide numbers up to 4 digits by a 1-digit number using the formal written method of short division and interpret remainders appropriately for the context; solve problems involving multiplication and division.		<u>N.C Objectives:</u> Solve problems involving multiplication and division.		<u>N.C Objectives:</u> Complete, read and interpret information in tables, including timetables. Solve comparison, sum and difference problems using information presented in a line graph. Solve comparison, sum and difference problems using information presented in a line graph.	
<u>Ready to Progress Statements (Key Learning):</u> SMD-1 Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size. SMD-2 Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors. SMD-3 Multiply any whole number with up to 4 digits by any one-digit number using a formal written method. SMD-4 Divide a number with up to 4 digits by a one-digit number using a formal written method, and interpret remainders appropriately for the context.		<u>Ready to Progress Statements (Key Learning):</u>		<u>Ready to Progress Statements (Key Learning):</u>	
<u>Teaching Resources:</u> Counters (between two), 100-square (between two), base 10 materials – ones (set between two), place-value discs (between two), place-value charts (between two), base 10 materials (between two)		<u>Teaching Resources:</u> /		<u>Teaching Resources:</u> /	
<u>Revisited Vital Vocabulary/ New Vital Vocabulary:</u> ones, tens, hundreds, thousands, ten thousands, hundred thousands, place value, approximate, difference, altogether, total, rename, multiple, factor, prime number, square number, cube number.		<u>Revisited Vital Vocabulary/ New Vital Vocabulary:</u> multiply, divide, bar model, reasonable, understand the problem, form a plan, action a plan, check your answer.		<u>Revisited Vital Vocabulary/ New Vital Vocabulary:</u> Duration, hour, minute, am, pm, 24 hour time, end time, midday, line graph, slope, axis, key, table, steepest line, increase, decrease, trend, volume, millilitres.	
<u>Sentence Starters</u> (Lesson specific language also online). The first multiple of ____ is ____. The second multiple of ____ is ____. The factors of 24 are ... The factors of 6 are ...	The common factors of 10 and 15 are ... A prime number is ... 100 is 10 times greater than ____. 1000 is 10 times greater than ____	<u>Sentence Starters</u> (Lesson specific language also online). There are ____ altogether. We can check using ____. I used ____ to work out the answer. The key information in this word problem is _____.	I know this because _____. My answer is reasonable because _____.	<u>Sentence Starters</u> (Lesson specific language also online). The longest journey is ... The shortest journey is ... The difference in journey time is ... I know this because ...	____ min equals ____ hour. The slope of a line on a line graph tells us that ... I found it easier to use the line graph for _____.

## Unit 6: Fractions.

(18 lessons - 4 weeks) (Spring 1).

### Progress in Learning:

This chapter develops pupils' ability to handle more diverse problems involving fractions, including dividing and multiplying fractions by whole numbers. To begin the chapter, pupils divide whole numbers by whole numbers, giving rise to fractions. Pupils then show improper fractions and mixed numbers using pictures. As they progress through the unit, they find equivalent fractions, compare and order fractions and utilise the number bond strategy, known as number pairs, in their work with fractions. Next, pupils review adding fractions, with a focus on fractions with different denominators and fractions that create improper fractions and mixed numbers. Then they subtract fractions that are different, finding common denominators and subtracting mixed numbers and improper fractions. At the end of the chapter, pupils begin to multiply fractions by whole numbers and multiply mixed numbers by whole numbers. The final lesson involves solving word problems that require multiple steps and bar model representations.

### N.C. Objectives

Recognise mixed numbers and improper fractions and convert from one form to the other. Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths. Compare and order fractions whose denominators are all multiples of the same number. Compare and order fractions whose denominators are all multiples of the same number. Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths. Compare and order fractions whose denominators are all multiples of the same number. 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.

### Ready to Progress Statements (Key Learning):

SF-1 Find non-unit fractions of quantities.  
SF-2 Find equivalent fractions and understand that they have the same value and the same position in the linear number system.  
SF-3 Recall decimal fraction equivalents for  $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{2}{5}$ ,  $\frac{4}{5}$  and for multiples of these proper fractions.

### Teaching Resources

Circular representations of fractions (useful but not essential)  
Coloured strips of paper/card for cutting and folding (useful but not essential)  
Access to a fraction wall (useful but not essential)

### Revisited Vital Vocabulary/ New Vital Vocabulary:

Mixed number, whole number, numerator, denominator, division, equal pieces, equivalent fractions, compare, order, greatest, smallest, common denominator, mixed number, proper fraction, improper fraction

### Sentence Starters (Lesson specific language also online).

To share \_\_\_ custard tarts between \_\_\_ plates, I can ...  
\_\_\_ quarters is the same as \_\_\_ whole and \_\_\_ quarters.  
Each piece is a \_\_\_ of the whole plot.  
When \_\_\_ equal parts become \_\_\_ equal parts,

When adding fractions, we must make the denominators the \_\_\_\_.

I drew a model with \_\_\_ parts to help.

When I subtract fractions I need to make sure the denominators are \_\_\_\_.

I can multiply the \_\_\_\_ by the whole number to get the answer.

## Unit 7: Decimals

(15 lessons - 3 weeks) (Spring 2).

### Progress in Learning:

In this chapter, pupils explore decimals. To begin this chapter, they learn to read and write decimal numbers. This is followed by comparing decimal numbers to find which is greater and smaller. Pupils then add and subtract decimals before turning decimals into fractions. The chapter ends with pupils rounding decimals to the nearest whole number and decimal position.

### N.C. Objectives

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. Read, write, order and compare numbers with up to three decimal places. Solve problems involving numbers up to three decimal places. Round decimals with two decimal places to the nearest whole number and to one decimal place.

### Ready to Progress Statements (Key Learning):

5NPV-1 Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1. Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01. Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01.  
5NPV-2 Recognise the place value of each digit in numbers with up to 2 decimal places, and compose and decompose numbers with up to 2 decimal places using standard and non-standard partitioning.

5NPV-3 Reason about the location of any number with up to 2 decimal places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each.

### Teaching Resources

Linking cubes (between two), Base 10 materials (between two), Place-value discs - 10, 1, 0.1, 0.01, 0.001 (between two), card strips divided into hundredths (between two), card strips divided into tenths (between two)  
Cards for Activity Time (between two), 1-9 digit cards (between two), Number lines (between two)

### Revisited Vital Vocabulary/ New Vital Vocabulary:

Ones, tenths, hundredths, thousandths, decimal, decimal point, greater than, less than, greatest, smallest, lightest, numerator, denominator, equivalent value, total, difference, perimeter, estimate, rounding.

### Sentence Starters (Lesson specific language also online).

It takes \_\_\_ of 100 square, 10 rod, 1 one) to make 1 whole.

This shows the number \_\_\_\_.

This shows \_\_\_ tenth(s) and \_\_\_\_

hundredth(s)/thousandth(s).

This shows \_\_\_ hundredth(s) and \_\_\_\_

[fraction] is equivalent to [decimal].

[decimal] is equivalent to [fraction].

I converted this fraction to a decimal by...

I converted this decimal to a fraction by...

The total cost of / difference between \_\_\_ and

\_\_\_ is \_\_\_\_.

[decimal number] has \_\_\_ one(s), \_\_\_ tenth(s)

and \_\_\_ hundredth(s).

\_\_\_\_\_

## Unit 8: Percentages

(3 lessons - 1 week) (Spring 2).

### Progress in Learning:

This chapter covers the expectations in Year 5 for percentage. It begins with comparing quantities and exposing percentage as an amount out of 100. The chapter finishes by having pupils convert fractions to hundredths, both by expanding fractions and by simplifying them.

### N.C. Objectives

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  $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{2}{5}$ ,  $\frac{4}{5}$  and those fractions with a denominator of a multiple of 10 or 25.

### Ready to Progress Statements (Key Learning):

N/A

### Teaching Resources

/

### Revisited Vital Vocabulary/ New Vital Vocabulary:

percentage, fraction, hundredths, decimal, percent.

### Sentence Starters (Lesson specific language also online).

\_\_\_% of \_\_\_ is \_\_\_\_.

I found \_\_\_ % by...

\_\_\_ parts is \_\_\_% of the total.

\_\_\_% is equal to \_\_\_\_.

An increase of \_\_\_% is \_\_\_\_.

A decrease of \_\_\_% is \_\_\_\_.

\_\_\_ is greater than \_\_\_\_.

\_\_\_ is less than \_\_\_\_.

\_\_\_ is \_\_\_ % more / less than \_\_\_\_.

## Unit 9: Geometry

(13 lessons - 3 weeks) (Spring 2/Summer 1).

### Progress in Learning:

This is the final chapter on geometry in Year 5. It explores angles: measuring angles; the investigation of angles on a line/point and drawing angles, before moving onto using angles as a descriptor for common shapes. The chapter ends with pupils solving problems involving angles and investigating angles inside regular polygons.

### N.C Objectives:

Estimate and compare acute, obtuse and reflex angles. Know angles are measured in degrees; estimate and compare acute, obtuse and reflex angles. Draw given angles, and measure them in degrees ( $^{\circ}$ ). Identify angles at a point on a straight line and  $1/2$  a turn (total  $180^{\circ}$ ). Use the properties of rectangles to deduce related facts and find missing lengths and angles. Identify angles at a point and one whole turn (total  $360^{\circ}$ ) and other multiples of  $90^{\circ}$ . Use the properties of rectangles to deduce related facts and find missing lengths and angles. Use the properties of rectangles to deduce. Identify angles at a point on a straight line and  $1/2$  a turn (total  $180^{\circ}$ ), and other multiples of  $90^{\circ}$ . Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.

### Ready to Progress Statements (Key Learning):

5G-1 Compare angles, estimate and measure angles in degrees ( $^{\circ}$ ) and draw angles of a given size.

### Teaching Resources:

Protractor

### Revisited: Vital Vocabulary/ New: Vital Vocabulary:

Acute angle, right angle, obtuse angle, reflex angle, quadrilateral, rectangle, square, parallel, internal angle, external angle, diagonal, regular polygon, pentagon, decagon, vertex, **protractor, degrees, diagonal, polygon**

**Sentence Starters:** (Lesson specific language also online).

This angle is a/an \_\_\_\_ angle.  
I know this is an acute/obtuse/reflex/right angle because...  
This angle is a/an \_\_\_\_ angle. It measures \_\_\_\_degrees.  
I measured this angle by...  
The size of this angle is \_\_\_\_degrees.

I calculated this angle by...  
I know this shape is a rectangle because...  
I know this rectangle is also a square because...  
I know this shape is not a rectangle because...  
\_\_\_\_ is parallel to \_\_\_\_.

## Unit 10: Position and Movement.

(5 lessons - 1 week) (Summer 1).

### Progress in Learning:

In this chapter, pupils are exploring position and movement. In the first lesson, they are naming and plotting points on a grid before moving onto the translation of a shape in the second lesson. They are then required to describe the movement of a shape on a grid as the first step in describing reflections. The chapter ends with pupils looking at and describing reflections across a mirror line.

### N.C Objectives:

Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.

### Ready to Progress Statements (Key Learning):

### Teaching Resources:

Graph paper, protractor, rules.

### Revisited: Vital Vocabulary/ New: Vital Vocabulary:

x-axis, y-axis, coordinates, x-coordinate, y-coordinate, reflection, image, **vertical, horizontal, translation, mirror line**

**Sentence Starters:** (Lesson specific language also online).

The coordinates of point [X] are...  
I plotted these coordinates on the grid by...  
The coordinates of point [X] are...  
Point [X] is translated \_\_\_\_ unit(s) \_\_\_\_ and \_\_\_\_ unit(s) \_\_\_\_.

I translated this shape by...  
The coordinates of point [X] are...  
I reflected this shape by...  
The coordinates of point [X] are...  
The shape was reflected in the \_\_\_\_ line and then in the \_\_\_\_ line.

## Unit 11: Measurements.

(14 lessons - 4 weeks) (Summer 1).

### Progress in Learning:

In this chapter, pupils are exploring the measurement of mass, temperature, time and length. The chapter begins with pupils converting units of length from millimetres to centimetres and from centimetres to metres. They quickly move on to converting metres to kilometres before looking at converting imperial measures to metric measures. Pupils explore converting units of mass in the same manner, finishing with imperial and metric conversions. They look at units of time in days, weeks, months and years, then in seconds, minutes and hours. The last lesson looks at temperature and how to use a vertical number line (thermometer). The chapter ends with a very challenging problem about changing lengths.

### N.C Objectives:

Convert between different units of metric measure (for example, kilometre and metres, centimetre and metres, centimetre and millimetre, gram and kilograms, litre and millilitre). 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 converting between units of time. Interpret negative numbers in context; count forwards and backwards with positive and negative whole numbers, including through zero.

### Ready to Progress Statements (Key Learning):

5NPV-5 Convert between units of measure, including using common decimals and fractions.

### Teaching Resources:

### Revisited: Vital Vocabulary/ New: Vital Vocabulary:

cm, mm, metre, km, mass, gram, kilogram, volume, litre, millilitre, inch, yard, mile, ounce, pound, **temperature, thermometer, yard, ounce, pint, gallon**

**Sentence Starters:** (Lesson specific language also online).

The \_\_\_\_ is \_\_\_\_ cm tall / long / wide.  
The \_\_\_\_ is \_\_\_\_ mm tall / long / wide.  
The \_\_\_\_ is \_\_\_\_ cm \_\_\_\_ mm tall / long / wide.  
I converted \_\_\_\_ cm to millimetres by...  
I converted \_\_\_\_ mm to centimetres by...  
I converted \_\_\_\_ m to kilometres by...

I converted \_\_\_\_ km to metres by...  
There are \_\_\_\_ inches in 1 foot.  
There are \_\_\_\_ feet in 1 yard.  
This length / height / mass / volume is \_\_\_\_ in the metric / imperial system.  
I converted \_\_\_\_ to \_\_\_\_ by...  
The temperature reading is \_\_\_\_ $^{\circ}$ C.  
\_\_\_\_ $^{\circ}$ C is colder / warmer than \_\_\_\_ $^{\circ}$ C.

## Unit 12: Area and Perimeter

(11 lessons - 3 weeks) (Summer 2).

### Progress in Learning:

In this chapter, pupils will be extending their knowledge of perimeter and area. It begins with pupils finding the perimeter of a polygon constructed from other polygons. They then look at constructing shapes with the same perimeter but a different area. Pupils begin to explore scale diagrams to determine the perimeter of shapes before moving onto exploring area using concrete materials. When they are familiar with the concept of area, they begin looking at area on square grids. Pupils will be using their understanding of polygons to calculate the area of those that are not 'regular polygons'. As the chapter progresses, they measure area in a variety of ways, determining the area of shapes from familiar shapes and using estimation to support their understanding.

### N.C. Objectives:

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<sup>2</sup>) and square metres (m<sup>2</sup>) and estimate the area of irregular shapes. Use all four operations to solve problems involving measure (for example, length, mass, volume, money) using decimal notation, including scaling.

### Ready to Progress Statements (Key Learning):

5G-2 Compare areas and calculate the area of rectangles (including squares) using standard units.

### Teaching Resources:

Ruler

### Revisited: Vital Vocabulary/ New: Vital Vocabulary:

Rectangle, square, perimeter, length, breadth, area, right angle, parallel, perpendicular, estimate, square unit, scale, scale drawing, vertical.

### Sentence Starters: (Lesson specific language also online).

The length of this rectangle is \_\_\_\_ and its breadth is \_\_\_\_.  
The perimeter of this rectangle is \_\_\_\_.  
I found this length by...  
This shape covers approximately \_\_\_\_ squares.  
\_\_\_\_ squares represents \_\_\_\_ m<sup>2</sup> in real life.  
I estimated the area by...

## Unit 13: Volume

(10 lessons - 2 weeks) (Summer 2).

### Progress in Learning:

In this chapter, pupils are exploring volume. In the first lesson, they learn about the volume of solids and how to use cubes to determine volume. Then they look at the volume of specific shapes such as rectangular boxes. The term 'capacity' is revisited in a lesson in the middle of this chapter, which helps pupils differentiate between 'volume' and 'capacity'. Next, they learn to convert between different metric units and then between metric and imperial units. The chapter ends with pupils solving increasingly challenging word problems related to volume.

### N.C. Objectives:

Estimate volume (for example, using 1 cm<sup>3</sup> blocks to build cuboids (including cubes)) and capacity (for example, using water). Identify 3-D shapes, including cubes and other cuboids, from 2-D representations. Use all four operations to solve problems involving measure (for example, length, mass, volume, money). Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre). Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints.

### Ready to Progress Statements (Key Learning):

### Teaching Resources:

Unit cubes

### Revisited: Vital Vocabulary/ New: Vital Vocabulary:

Volume, cubic units, cubic centimetre, cubic metre, cuboid, length, breadth, height, litre, millimetre, capacity.

### Sentence Starters: (Lesson specific language also online).

This solid is made from \_\_\_\_ unit cubes.  
The volume of this solid is \_\_\_\_ cubic units.  
The volume of this solid is \_\_\_\_ cubic centimetres/metres.  
I found the volume of this solid by...  
The capacity of this container is \_\_\_\_ litres/millilitres.  
I found the capacity of this container by...