Elliston Primary School Progression in Maths Years 1 -3

Year	1	2	3
Big Ideas **NCETM** **Place Value**	The position a digit is placed in a number determines its value. The language used to name numbers does not always expose the place value, for example the word 'twelve' does not make it transparent that the value of this number is ten and two. It is important that children develop secure understanding of the value of each digit. Place value is based on unitising: treating a group of things as one 'unit'. In mathematics, units can be any size, for example units of 1, 2, 5 and 10 are used in money. In place value units of 1, 10 and 100 are used.	The position (place) of a digit in a number determines its value. Hence the term place value.	The value of a digit is determined by its position in a number. Place value is based on unitising, treating a group of things as one 'unit'. This generalises to 3 units + 2 units = 5 units (where the units are the same size).
Place Value Counting	• count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number • count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens **Autumn 1** **Autumn 2** **Spring 2** **Summer 2**	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward **Autumn 1**	count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number **Autumn 1** **Autumn 2**

NRICH	Biscuit decorations https://nrich.maths.org/154 Shut the box https://nrich.maths.org/6074 Same length Trains https://nrich.maths.org/4332 Grouping Goodies https://nrich.maths.org/232	Five steps to 50 https://nrich.maths.org/10586 Busy Bee https://nrich.maths.org/194	
Progression in Reasoning NCETM	**Spot the mistake:** 5,6,8,9 What is wrong with this sequence of numbers? **True or False?** I start at 2 and count in twos. I will say 9 What comes next? 10+1 = 11, 11+1= 12, 12+1 = 13	**Spot the mistake:** 45,40,35,25 What is wrong with this sequence of numbers? **True or False?** I start at 3 and count in threes. I will say 13? What comes next? 41+5=46, 46+5=51, 51+5=56	**Spot the mistake:** 50,100,115,200 What is wrong with this sequence of numbers? **True or False?** 38 is a multiple of 8 What comes next? 936-10= 926 926 -10 = 916 916- 10= 906
Place Value: represent	• identify and represent numbers using objects and pictorial representations including the number line • read and write numbers to 100 in numerals • read and write numbers from 1 to 20 in numerals and words. **Autumn 1** **Autumn 2** **Spring 1** **Summer 2**	• 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 **Autumn 1**	• identify, represent and estimate numbers using different representations • read and write numbers up to 1000 in numerals and in words **Autumn 1**

Place value: compare	▯ given a number, identify one more and one less **Autumn 1** **Autumn 2** **Spring 1**	• 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

	Summer 2	**Autumn 1**	**Autumn 1**
NCETM Spine	AS Y1 1.2, 1.8, 1.9 1.10	AS Y1 (1.1)	
Nrich	What's in a name? https://nrich.maths.org/7952 Count the digits https://nrich.maths.org/7302 Making Sticks https://nrich.maths.org/231 Robot Monsters https://nrich.maths.org/2404 Dotty Six https://nrich.maths.org/7337	That Number Square https://nrich.maths.org/8169 100 square jigsaw https://nrich.maths.org/5572 Next Domino https://nrich.maths.org/168 Domino Number Patterns https://nrich.maths.org/225 Domino Number Sequences https://nrich.maths.org/241 Snail One hundred https://nrich.maths.org/8303 Two Digit Targets https://nrich.maths.org/6343 6 Beads https://nrich.maths.org/152 How Would We Count? https://nrich.maths.org/8123	Coded Hundred Square https://nrich.maths.org/6554

Progression in Reasoning	**Do, then explain** Look at the objects (in a collection). Are there more of one type than another? How can you find out?	**Do, then explain** 37 13 73 33 3 If you wrote these numbers in order starting with the smallest, which number would be third? Explain how you ordered the numbers. **Do, then explain** Show the value of the digit 2 in these numbers? 32 27 92 Explain how you know.	**Do, then explain** 835 535 538 388 508 If you wrote these numbers in order starting with the smallest, which number would be third? Explain how you ordered the numbers **Do, then explain** Show the 3 value of the digit 3 in these numbers? 341 503 937 Explain how you know.
		Make up an example Create numbers where the units digit is one less than the tens digit. What is the largest/smallest number?	Make up an example Create numbers where the digit sum is three. E.g. 120, 300, 210 What is the largest/smallest number?
Place value: problems and rounding		▯ use place value and number facts to solve problems **Autumn 1**	▯ solve number problems and practical problems involving these ideas. **Autumn 1**
NRich		Round the Two Dice https://nrich.maths.org/10435 Largest Even https://nrich.maths.org/7431 Light the Lights https://nrich.maths.org/7044 I Like … https://nrich.maths.org/6962	Take Three Numbers https://nrich.maths.org/8063 A Mixed-Up Clock https://nrich.maths.org/2127 Number Match https://nrich.maths.org/6937 Number Differences https://nrich.maths.org/2790 Magic V's https://nrich.maths.org/6274 Planning a School Trip https://nrich.maths.org/6969

Progression in Problem Solving			**Possible answers** A number rounded to the nearest ten is 540. What is the smallest possible number it could be? What do you notice? Round 296 to the nearest 10. Round it to the nearest 100. What do you notice? Can you suggest other numbers like this?

Year	**1**	**2**	**3**
Big Ideas NCETM **Addition & Subtraction**	Relating numbers to 5 and 10 helps develop knowledge of the number bonds within 20. Forexample, given 8 + 7, thinking of 7 as 2 + 5and adding the 2 to 8 to make 10 and then the 5 to total 15.	Understanding that addition of two or more numbers can be done in any order is important	Relating numbers to 5 and 10 helps develop knowledge of the number bonds within 20. For example, given 8 + 7, thinking of 7 as 2 + 5, and adding the 2

	Thinking of part whole relationships is helpfulin linking addition and subtraction. For example, where the whole is 6, and 4 and 2 are parts. This means that 4 and 2 together form the whole, which is 6 and 6 subtract 4 leaves the 2 and 6 subtract 2 leaves the 4.	to support children's fluency. When adding two numbers it can be more efficient to put the larger number first. For example, given 3 + 8 it is easier to calculate 8 + 3. When adding three or more numbers it is helpful to look for pairs of numbers that are easy to add. For example, given 5 + 8 + 2 it is easier to add 8 + 2 first than to begin with 5 + 8. Understanding the importance of the equals sign meaning 'equivalent to' (i.e. that 6 + 4 = 10, 10 = 6 + 4 and 5 + 5 = 6 + 4 are all valid uses of the equals sign) is crucial for later work in algebra. Empty box problems can support the development of this key idea. Correct use of the equals sign should be reinforced at all times. Altering where the equals sign is placed develops fluency and flexibility.	and 8 to make 10, then the 5 to 15. This should then be applied when calculating with larger numbers. Subtraction bonds can be thought of in terms of addition: for example, in answering 15 – 8, thinking what needs to be added to 8 to make 15. Counting on for subtraction is a useful strategy that can also be applied to larger numbers.
Addition and subtraction: Recall, Represent & Use	• read, write and interpret mathematical statements involving addition (+), subtraction(–) and equals (=) signs • represent and use number bonds and related subtraction facts within 20 **Autumn 1 Autumn 2 Spring 1**	• recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • show that addition of two numbers can be done in any order(commutative) and subtraction of one number from another cannot • recognise and use the inverse relationship between addition and subtraction and use this to check	estimate the answer to a calculation and use inverse operations to check answers **Autumn 2**

		calculations and solve missing number problems **Autumn 2**	
NCETM Spine	AS Y1 1.2, 1.3, 1.4, 1.5 1.6 1.7	AS Y2 1.11, 1.12, 1.13, 1.14, 1.15 1.16	
NRich	Domino Recall https://nrich.maths.org/4940 One Big Triangle https://nrich.maths.org/192 Ladybirds in the Garden https://nrich.maths.org/1816 NumberLines https://nrich.maths.org/5652 Pairs of Numbers https://nrich.maths.org/7233 Butterfly Flowers https://nrich.maths.org/229 2,4,6,8 https://nrich.maths.org/175?time=1188566002 How Do You See It? https://nrich.maths.org/8296 What Could It Be? https://nrich.maths.org/10479	Strike It Out https://nrich.maths.org/6589 4 Dom https://nrich.maths.org/179 Number Round Up https://nrich.maths.org/188	

Addition & Subtraction: Calculations	add and subtract one-digit and two-digit numbers to 20, including zero **Autumn 1 Autumn 2 Spring 1**	• 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 **Autumn 2**	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 **Autumn 2**
NRich	2,4,6,8 https://nrich.maths.org/175?time=1188566002 How Do You See It? https://nrich.maths.org/8296 What Could It Be? https://nrich.maths.org/10479	Dicey Addition https://nrich.maths.org/11863 Unit Differences https://nrich.maths.org/10480 Number Balance https://nrich.maths.org/4725 Jumping Squares https://nrich.maths.org/7471	

Progression in Reasoning NCETM **Addition & Subtraction**	**Convince me** In my head I have two odd numbers with a difference of 2. What could they be? Convince me **Missing numbers** Fill in the missing numbers (using a range of practical resources to support) 12 + -- = 19 20 - --= 3 **Fact families** Which four number sentences link these numbers? 12, 15, 3 What else do you know? If you know; 12 – 9 = 3 what other facts do you know? **Missing symbols** Write the missing symbols (+ - =) in these number sentences: 17 3 20 18 20 2 **Working backwards** Through practical games on number tracks and lines ask questions such as “where have you landed?” and “what numbers would you need to throw to land on other given numbers?” What do you notice?	**Convince me** What digits could go in the boxes? Try to find all of the possible answers. How do you know you have got them all? Convince me 7 - 2 = 46 **Fact families** Which four number sentences link these numbers? 100, 67, 33 What else do you know? If you know; 87 = 100 – 13 what other facts do you know? **Missing symbols** Write the missing symbols (+ - =) in these number sentences: 80 20 100 100 70 30 87 13 100 **True or false?** Are these number sentences true or false? Give your reasons. 73 + 40 = 113 98 – 18 = 70	**True or false?** Are these number sentences true or false? 597 + 7 = 614 804 – 70 = 744 768 + 140 = 908 Give your reasons. **Hard and easy questions** Which questions are easy / hard? 323 + 10 = 393 + 10 = 454 - 100 = 954 - 120 = Explain why you think the hard questions are hard? Convince me __ __ + __ __ = __ __ __ The total is 201 Each missing digit is either a 9 or a 1. Write in the missing digits.

	11 – 1 = 10 11 – 10 = 1 Can you make up some other number sentences like this involving 3 different numbers? Continue the pattern 10 + 8 = 18 11 + 7 = 18 Can you make up a similar pattern for the number 17? How would this pattern look if it included subtraction? **Missing numbers** 9 + = 10 10 - = 9 What number goes in the missing box?	46 + 77 = 123 92 – 67 = 35 **Hard and easy questions** Which questions are easy / hard? Explain why you think the hard questions are hard? 23 + 10 = 93 + 10 = 54 + 9 = 54 + 1 = **Other possibilities** + + = 14 What single digit numbers could go in the boxes? How many different ways can you do this? Continue the pattern 90 = 100 – 10 80 = 100 – 20 Can you make up a similar pattern starting with the numbers 74, 26 and 100? **Missing numbers** What number goes in the missing box? 91 + = 100 100 - = 89	Is there only one way of doing this or lots of ways? Convince me **Possibilities** I bought a book which cost between £9 and £10 and I paid with a ten pound note. My change was between 50p and £1 and was all in silver coins. What price could I have paid?
Addition & Subtraction: Solve problems	□ solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = __ – 9. **Autumn 2** **Spring 1**	• 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 **Autumn** **2**	□ solve problems, including missing number problems, using number facts, place value, and more complex addition & subtraction. **Autumn 2**

Nrich	The Tall Tower https://nrich.maths.org/2354	Heads and Feet https://nrich.maths.org/924 Two Spinners https://nrich.maths.org/10391 Cuisenaire Counting https://nrich.maths.org/2724 Birthday Cakes https://nrich.maths.org/246 The Brown Family https://nrich.maths.org/2003 Eggs in Baskets https://nrich.maths.org/2002 Noah https://nrich.maths.org/136	Sitting Round the Party Tables https://nrich.maths.org/7228
Progression in Reasoning NCETM **Addition & Subtraction Problem Solving**	**Making an estimate** Pick (from a selection of number sentences) the ones where the answer is 8 or 9. **Is it true that?** Is it true that 3+4 = 4 + 3?	**Making an estimate** Which of these number sentences have the answer that is between 50 and 60 74 - 13 55 + 17 87 – 34 **Always, sometimes, never** Is it always, sometimes or never true that if you add three numbers less than 10 the answer will be an odd number	**Making an estimate** Which of these number sentences have the answer that is between 50 and 60 174 - 119; 333 – 276; 932 - 871 **Always, sometimes, never** Is it always, sometimes or never true that if you subtract a multiple of 10 from any number the units digit of that number stays the same? Is it always, sometimes or never true that when you add two numbers together you will get an even number?

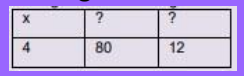
Year	**1**	**2**	**3**

Big Ideas NCETM	Counting in steps of equal sizes is based on the big idea of 'unitising' ; treating a	It is important that pupils both commit multiplication facts to memory and also develop	It is important for children not just to be able to chant their multiplication tables but also to

Multiplication & Division	group of, say, five objects as one unit of five. Working with arrays helps pupils to become aware of the commutative property of multiplication, that 2 × 5 is equivalent to 5 × 2.	an understanding of conceptual relationships. This will aid them in using known facts to work out unknown facts and in solving problems. Pupils should look for and recognise patterns within tables and connections between them (e.g. 5× is half of 10×). Pupils should recognise multiplication and division as inverse operations and use this knowledge to solve problems. They should also recognise division as both grouping and sharing. The recognition of pattern in multiplication helps pupils commit facts to memory, for example doubling twice is the same as multiplying by four, or halving a multiple of ten gives you the related multiple of five.	understand what the facts in them mean, to be able to use these facts to figure out others and to use in problems. It is also important for children to be able to link facts within the tables (e.g. 5× is half of 10×). They understand what multiplication means, see division as both grouping and sharing, and see division as the inverse of multiplication.

Multiplication & division: Recall, Represent & 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 **Autumn 2** **Spring 1**	□ recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables **Autumn 2**

NCETM Spine		MD Y2 2.3, 2.4 2.5 2.6	
NRich		I'm 8 https://nrich.maths.org/55 Which Symbol? https://nrich.maths.org/6777 Ordering Cards https://nrich.maths.org/8058	

Progression In Reasoning NCETM	**Making links** If one teddy has two apples, how many apples will three teddies have? Here are 10 lego people If 2 people fit into the train carriage, how many carriages do we need? **Practical** If we put two pencils in each pencil pot how many pencils will we need? **Spot the mistake** Use a puppet to count but make some deliberate mistakes. e.g. 2 4 5 6 10 9 8 6 See if the pupils can spot the deliberate mistake and correct the puppet	**Making links** Write the multiplication number sentences to describe this array X X X X X X What do you notice? Write the division sentences. **Prove It** Which four number sentences link these numbers? 3, 5, 15? Prove it **Missing numbers** 10 = 5 x What number could be written in the box? Making links I have 30p in my pocket in 5p coins. How many coins do I have? **True or false?** When you count up in tens starting at 5 there will always be 5 units.	**Use a fact** 20 x 3 = 60.Use this fact to work out 21 x 3 = 22 x 3 = 23 x 3 = 24 x 3 = **Prove It** What goes in the missing box?  Prove it. How close can you get? __ __× ___ Using the digits 2, 3 and 4 in the calculation above how close can you get to 100? What is the largest product? What is the smallest product? **Missing numbers** 24 = x Which pairs of numbers could be written in the boxes? Making links Cards come in packs of 4. How many packs do I need to buy to get 32 cards? **True or false?** All the numbers in the two times table are
			even. There are no numbers in the three times table that are also in the two times table.

Multiplication & Division: Calculations		calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs **Autumn 2** **Spring 1**	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 **Autumn 2** **Spring 1**
NRich		Double or Halve https://nrich.maths.org/10654 Clapping Times https://nrich.maths.org/5482 How Odd https://nrich.maths.org/7190 More Numbers in the Ring https://nrich.maths.org/2783 Ring a Ring of Numbers https://nrich.maths.org/2782 Even and Odd https://nrich.maths.org/6895 Odd Times Even https://nrich.maths.org/8062	Music to my Ears https://nrich.maths.org/5483
Progression in Reasoning NCETM Checking		**Use the inverse** Use the inverse to check if the following calculations are correct: 12 ÷ 3 = 4 3 x 5 = 14	**Use the inverse** Use the inverse to check if the following calculations are correct 23 x 4 = 82; 117 ÷ 9 = 14 Size of an answer Will the answer to the following calculations be greater or less than 80
			23 x 3= 32 x 3 = 42 x 3 = 36 x 2=

Multiplication & Division: Solve Problems	▯ solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. **Summer 1**	▯ solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts. **Autumn 2** **Spring 1**	▯ 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. **Spring 1**
NCETM Spine		MD Y2 2.2	
NRich	Share Bears https://nrich.maths.org/2358 Lots of Biscuits https://nrich.maths.org/6883 Doubling Fives https://nrich.maths.org/10588	Growing Garlic https://nrich.maths.org/5579 Lots of Lollies https://nrich.maths.org/2360 The Tomato and the Bean https://nrich.maths.org/1079 The Amazing Splitting Plant https://nrich.maths.org/159 Magic Plant https://nrich.maths.org/145 Our Numbers https://nrich.maths.org/7006	Journeys in Numberland https://nrich.maths.org/7285 Ip Dip https://nrich.maths.org/7185 What's in the Box https://nrich.maths.org/5576 Follow the Numbers https://nrich.maths.org/7127 This Pied Piper of Hamelin https://nrich.maths.org/8315 What Do You Need https://nrich.maths.org/5950 A Square of Numbers https://nrich.maths.org/2005

Year	1	2	3
Big Ideas NCETM Fractions	Fractions express a relationship between a whole and equal parts of the whole. Ensure children express this relationship when talking about	Fractions involve a relationship between a whole and parts of a whole. Ensure children express this relationship when	Fractions are equal parts of a whole. Equal parts of shapes do not need to be congruent but need to be equal in area.

	fractions. For example, 'If the circle (where the circle is divided into four equal parts with one part shaded) is the whole, one part is one quarter of the whole circle.' Halving involves partitioning an object, shape or quantity into two equal parts. The two parts need to be equivalent in, for example, area, mass or quantity.	talking about fractions. For example, 'If the bag of 12 sweets is the whole, then 4 sweets are one third of the whole.' Partitioning or 'fair share' problems when each share is less than one gives rise to fractions. Measuring where the unit is longer than the item being measured gives rise to fractions.	Decimal fractions are linked to other fractions. The number line is a useful representation that helps children to think about fractions as numbers.
Fractions: Recognise & Write	• recognise, find and name a half as one of two equal parts of an object, shape or quantity • recognise, find and name a quarter as one of four equal parts of an object, shape or quantity. **Summer 1**	recognise, find, name and write fractions of a length, shape, set of $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity **Spring 2**	• count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 • recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators • recognise and use fractions as numbers: unit fractions and nonunit fractions with small denominators **Spring 2**
NCETM Spine	F KS1 3.0	F KS1 3.0	
NRich	Halving https://nrich.maths.org/1788 Happy Halving https://nrich.maths.org/217		

Fractions: Compare		▯ recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$ **Spring 2**	▯ recognise and show, using diagrams, equivalent fractions with small denominators

			▯ compare and order unit fractions, and fractions with the same denominators **Summer 1**
Progression in Reasoning NCETM Finding & Using Equivalence		**Odd one out**. Which is the odd one out in this trio: ½ 2/4 ¼ Why? What do you notice? Find ½ of 8, Find 2/4 of 8. What do you notice?	**Odd one out.** Which is the odd one out in each of these trios? ½ 3/6 5/8 3/9 2/6 4/9 Why?
Fractions: Calculations		▯ write simple fractions for example, $\frac{1}{2}$ of 6 = 3 **Spring 2**	▯ add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$ **Summer 1**
Fractions: Solve Problems			▯ solve problems that involve all of the above. **Spring 2** **Summer 1**

Progression in Reasoning NCETM Fractions	**What do you notice?** Choose a number of counters. Place them onto 2 plates so that there is the same number on each half. When can you do this and when can't you? What do you notice? True or false? Sharing 8 apples between 4 children means each child has 1 apple.	**What do you notice?** ¼ of 4 = 1 ¼ of 8 = 2 ¼ of 12 = 3 Continue the pattern What do you notice? **True or false?** Half of 20cm = 5cm ¾ of 12cm = 9cm **Ordering** Put these fractions in the correct order, starting with the smallest. ½ ¼ 1/3	**What comes next?** 6/10, 7/10, 8/10, ….., 12/10, 11/10, ….., ….., … **True or false?** 2/10 of 20cm = 2cm 4/10 of 40cm = 4cm 3/5 of 20cm = 12cm Give an example of a fraction that is less than a half. Now another example that no one else will think of. Explain how you know the fraction is less than a half. (draw an image) **Put in Order**

			Ben put these fractions in order starting with the smallest. Are they in the correct order? One fifth, one seventh, one sixth What do you notice? 1/10 of 10 = 1 2/10 of 10 = 2 3/10 of 10 = 3 Continue the pattern. What do you notice? What about 1/10 of 20? Use this to work out 2/10 of 20, etc What do you notice? Find 2/5 of 10 Find 4/10 of 10. What do you notice? Can you write any other similar statements?
Decimals: Recognise and Write			

Decimals: Compare			
Decimals: Calculation and Problems			
Progression in Reasoning NCETM Decimals		**Spot the mistake… and correct it** 7, 7 ½ , 8, 9, 10 8 ½, 8, 7, 6 ½, What comes next? 5 ½, 6 ½ , 7 ½ , …., …. 9 ½, 9, 8 ½, ……, …..	**Spot the mistake** six tenths, seven tenths, eight tenths, nine tenths, eleven tenths … and correct it.
Fractions, Decimals and Percentages			
Progression in Reasoning NCETM Calculating with FDP			**What do you notice?** 1/10 + 9/10 = 1 2/10 + 8/10 = 1 3/10 + 7/10 = 1 Continue the pattern Can you make up a similar pattern for eighths? The answer is 5/10, what is the question? (involving fractions / operations)

Year	1	2	3

Big Ideas NCETM Measurement	Measurement is about comparison, for example measuring to find out which rope is the longest. Measurement is about equivalence, for example how many cubes are equivalent to the length of the table or the mass of the teddy? Standard units can initially be introduced through using a unit that is greater than the things being compared, for example comparing the capacity of a cup and a carton by filling each and pouring into matching bottles to compare the two. Measuring is a practical activity and activities should be conducted in practical contexts, using real materials.	We need standard units of measure in order to compare things more accurately and consistently.	Developing benchmarks to support estimation skills is important as pupils become confident in their use of standard measures. The height of a door frame, for example, is approximately 2 metres, and a bag of sugar weighs approximately 1 kilogram.

Measures: Using Measures	• compare, describe and solve practical problems for: • lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] • mass/weight [for example, heavy/light, heavier than, lighter than] • capacity and volume [for example, full/empty, more than, less than, half, half full, quarter] • time [for example, quicker, slower, earlier, later] • measure and begin to record the following: lengths and heights mass/weight capacity and volume time (hours, minutes, seconds) **Spring 2** **Summer 2**	• 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 = **Spring 2** **Summer 2**	measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) **Spring 2** **Summer 2**
NRich	Wallpaper https://nrich.maths.org/4964 Sizing Them Up https://nrich.maths.org/4962 The Animals' Sports Day https://nrich.maths.org/7789 Different Sizes https://nrich.maths.org/8117 How Tall https://nrich.maths.org/7536 Can You Do It Too https://nrich.maths.org/8327	Little Man https://nrich.maths.org/4789 Discuss and Choose https://nrich.maths.org/7449 Compare the Cups https://nrich.maths.org/10656 Order, Order https://nrich.maths.org/7340	Car Journey https://nrich.maths.org/10350

Progression in Reasoning NCETM Measures	**Top tips** How do you know that this (object) is	**Top tips**	**Top Tips**
	heavier / longer / taller than this one? Explain how you know **Application (Can be practical)** Which two pieces of string are the same length as this book?	Put these measurements in order starting with the smallest. 75 grammes 85 grammes 100 grammes Explain your thinking **Position the symbols** Place the correct symbol between the measurements > or < 36cm 63cm 130ml 103ml Explain your thinking **Application (Practical)** Draw two lines whose lengths differ by 4cm.	Put these measurements in order starting with the largest. Explain your thinking Half a litre, Quarter of a litre, 300 ml Position the symbols Place the correct symbol between the measurements > or < 306cm Half a metre 930 ml 1 litre **Write more statements** If there are 630ml of water in a jug. How much water do you need to add to end up with a litre of water? What if there was 450 ml to start with? **Testing conditions** A square has sides of a whole number of centimetres. Which of the following measurements could represent its perimeter?8cm 18cm 24cm 25cm
Measurement: Money	▯ recognise and know the value of different denominations of coins and notes **Summer 2**	• 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 **Autumn 2**	▯ add and subtract amounts of money to give change, using both £ and p in practical contexts **Spring 1**

NCETM Spine	MD Y1 2.1		
NRich		Money Bags https://nrich.maths.org/1116 Five Coins https://nrich.maths.org/142	

Progression in Reasoning NCETM	**Possibilities** Ella has two silver coins. How much money might she have?	**Possibilities** How many different ways can you make 63p using only 20p, 10p and 1p coins?	**Position the symbols** Place the correct symbols between the measurements > or < Explain your thinking £23.60 2326p 2623p
Measurement: Time **Telling the time is not taught in lessons but referred to continuously.**	• 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. **Summer 2**	• 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. **Summer 2**	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 increa accuracy to the nearest minute; re and compare time in terms of secc minutes and hours; use vocabulary such as o'clock, a.m./p.m., mornin afternoon, noon and midnight kno the number of seconds in a minute the number of days in each month year and leap year compare durati of events [for example to calculate time taken by particular events or tasks]. **Summer 1**

NRich	The Games Medals https://nrich.maths.org/7763 Times of Day https://nrich.maths.org/6609	Stop the Clock https://nrich.maths.org/6071 What is the Time? https://nrich.maths.org/7377 Matching Time https://nrich.maths.org/10332	5 on the Clock https://nrich.maths.org/1981 The Time Is … https://nrich.maths.org/7384 Clocks https://nrich.maths.org/1812 Watch the Clock https://nrich.maths.org/980
Progression in Reasoning NCETM Time	**Explain thinking** Ask pupils to reason and make statements	**Undoing**	**Undoing**

	about to the order of daily routines in school e.g. daily timetable e.g. we go to PE after we go to lunch. Is this true or false? What do we do before break time?	The film finishes two hours after it starts. It finishes at 4.30. What time did it start? Draw the clock at the start and the finish of the film. **Explain thinking** The time is 3:15pm. Kate says that in two hours she will be at her football game which starts at 4:15. Is Kate right? Explain why. **Working backwards** Draw hands on the clock faces to show when break started and when it finished 15 minutes later at 10:35. The answer is …. 3 hours What is the question? **What do you notice?** 1 hour = 60 minutes ½ hour = 30 minutes ¼ hour = 15 minutes Write down some more time facts like these	A programme lasting 45 minutes finishes at 5.20. At what time did it start? Draw the clock at the start and finish time. Explain thinking Salha says that 100 minutes is the same as 1 hour. Is Salha right? Explain why. **Working backwards** Tom's bus journey takes half an hour. He arrives at his destination at 9:25. At what time did his bus leave? 9:05 8:55 8:45 The answer is …. 25 minutes What is the question? **What do you notice?** 1 minute = 60 seconds 2 minutes = 120 seconds Continue the pattern Write down some more time facts like these
Measurement: Perimeter, Area and Volume			measure the perimeter of simple 2D shapes **Spring 2**
Progression in Reasoning NCETM			**Testing conditions** A square has sides of a whole number of centimetres. Which of the following measurements could represent its perimeter?8cm 18cm 24cm 25cm

Year	1	2	3
Big Ideas NCETM Geometry	It is important for children to be familiar with a range of 2-D and 3-D shapes and not just recognise them in specific orientations. It is preferable to introduce 3-D shapes before 2-D shapes, since 2-D shapes only exist in the real world as faces of 3-D shapes. An emphasis should be placed upon identifying and describing the properties of shapes. It is important that pupils develop the correct mathematical language to do so. the development of precise language to describe position and movement is important.	It is not uncommon for pupils to say that this is a square and this is not , or that something like this is a triangle due to orientation. It is important for pupils to know what the properties are that make up certain shapes, and for them not to just learn the names of typical proto looking shapes. It is helpful to think about non examples of shapes. For example, why this is not a triangle: Recognising pattern and generalising structures and relationships are key elements for laying the foundations for later work in algebra.	During this year there is an increasing range of shapes that pupils are familiar with. The introduction of symmetrical and nonsymmetrical polygons and the requirement that pupils should be able to draw them will give rise to discussions about lengths of sides and sizes of angles. Pupils need to appreciate these features as properties of shapes as well as the number of sides and vertices. Pupils recognise that angles are about the amount of turn – the lengths of the lines used to represent angles do not affect the size of the angle. Pupils recognise that relationships are at the heart of properties of shapes, not particular measurements. For example, the opposite sides of any rectangle will always be equal, not that rectangles have a pair of long sides and a pair of short sides.

Geometry: 2d shapes	▯ recognise and name common 2-D shapes, [for example, rectangles (including squares), circles and triangles] **Autumn 2**	• 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]	▯ draw 2-D shapes **Summer 2**

		▯ compare and sort common 2-D shapes and everyday objects. **Autumn 2**	
NRich	Shaping It https://nrich.maths.org/7301 What's Happening? https://nrich.maths.org/7810 Jig Shapes https://nrich.maths.org/6886 Overlaps https://nrich.maths.org/5819	Inside Triangles https://nrich.maths.org/5648 Let's Investigate Triangles https://nrich.maths.org/93 Complete the Square https://nrich.maths.org/2910 Exploded Square https://nrich.maths.org/7008 Colouring Triangles https://nrich.maths.org/171 Shapely Lines https://nrich.maths.org/7009 Data Shapes https://nrich.maths.org/7523 Matching Triangles https://nrich.maths.org/5638	Board Block Challenge https://nrich.maths.org/2872 Stick Images https://nrich.maths.org/6980 Shapes on the Playground https://nrich.maths.org/1054 Sorting Logic Blocks https://nrich.maths.org/7192
Geometry: 3d shapes	▯ recognise and name common 3d shapes, [for example, cuboids (including cubes), pyramids and spheres]. **Autumn 2**		▯ make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them **Summer 2**

NRich		Rolling That Cube https://nrich.maths.org/7299 Skeleton Shapes https://nrich.maths.org/1156 Building with Solid Shapes https://nrich.maths.org/239 Cubes Cut Into Four Pieces https://nrich.maths.org/233	Building Blocks https://nrich.maths.org/2343 The Third Dimension https://nrich.maths.org/1148 Triple Cubes https://nrich.maths.org/7128 Sponge Sections https://nrich.maths.org/2156 A Puzzling Cube https://nrich.maths.org/1140

Progression in reasoning – Geometry **Properties of shape** **NCETM**	**What's the same, what's different?** Find a rectangle and a triangle in this set of shapes. Tell me one thing that's the same about them. Tell me one thing that is different about them. **Visualising** Put some shapes in a bag. Find me a shape that has more than three edges. **True or false?** All 2-D shapes have at least 4 sides **Other possibilities** Can you find shapes that can go with the set with this label? "Have straight sides"	**What's the same, what's different?** Pick up and look at these 3-D shapes.  Do they all have straight edges and flat faces? What is the same and what is different about these shapes? **Visualising** In your head picture a rectangle that is twice as long as it is wide. What could its measurements be? **Always, sometimes, never** Is it always, sometimes or nerver true that when you fold a square in half you get a rectangle. **Other possibilities** Can you find shapes that can go with the set with this label? "Have straight sides and all sides are the same length"	**What's the same, what's different?** What is the same and different about these three 2-D shapes?  **Visualising** I am thinking of a 3-dimensional shape which has faces that are triangles and squares. What could my shape be? **Other possibilities** One face of a 3-D shape looks like this. What could it be? Are there any other possibilities? **Always, sometimes, never** Is it always, sometimes or never that all sides of a hexagon are the same length? **Other possibilities** Can you find shapes that can go with the set with this label? "Have straight sides that are different lengths." Convince me Which capital letters have perpendicular and / or parallel lines? Convince me
Geometry: Angles 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.

			Summer 2
Progression in Reasoning NCETM Angles			**Always, sometimes, never** Is it always, sometimes or never that all sides of a hexagon are the same length? **Other possibilities** Can you find shapes that can go with the set with this label? "Have straight sides that are different lengths." **Convince me** Which capital letters have perpendicular and /or parallel lines? Convince me.
Geometry: Position and Direction	describe position, direction and movement, including whole, half, quarter and three-quarter turns. **Summer 1** **Summer 2**	• order and arrange combinations of mathematical objects in patterns and sequences • use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise). **Summer 1**	

NRich	Tangram Tangle https://nrich.maths.org/2398 Olympic Rings https://nrich.maths.org/7551 2 Rings https://nrich.maths.org/5330 Turning https://nrich.maths.org/5656	Three Ball Line Up https://nrich.maths.org/2858 Hundred Square https://nrich.maths.org/2397 Break It Up https://nrich.maths.org/2284 Domino Patterns https://nrich.maths.org/9970 Repeating Patterns	
		https://nrich.maths.org/5944 Caterpillars https://nrich.maths.org/5742 A City of Towers https://nrich.maths.org/183 Triple Cubes https://nrich.maths.org/7128	

Year	1	2	3
Statistics NCETM Big Ideas	Statistics does not appear explicitly in the Year 1 curriculum. Additions included here focus around adaptation to the Year 2 curriculum	Data need to be collected with a question or purpose in mind. Tally charts are used to collect data over time (cars passing the school, birds on the bird table).	Data needs to be collected with a question or purpose in mind. Tally charts are used to collect data over time (cars passing the school, birds on the bird table). They can also be used to keep track of counting.
Statistics: Present and Interpret		interpret and construct simple pictograms, tally charts, block diagrams and simple tables **Summer 1**	interpret and present data using bar charts, pictograms and tables **Spring 1**

NRich		Ladybird Count https://nrich.maths.org/2341 What Shape and Colour? https://nrich.maths.org/2185 Plants https://nrich.maths.org/36 If The World Were A Village https://nrich.maths.org/7725 Sticky Data https://nrich.maths.org/7687	Class 5's names https://nrich.maths.org/7522 Going For Gold https://nrich.maths.org/7800 The Domesday Project https://nrich.maths.org/7554 The Car That Passes https://nrich.maths.org/7249 Now and Then https://nrich.maths.org/8171

		Beads and Bags https://nrich.maths.org/7374 Button Up https://nrich.maths.org/7227 Sort the Street https://nrich.maths.org/5157 Mixed Up Socks https://nrich.maths.org/166 The Hair Colour Game https://nrich.maths.org/6964	Real Statistics https://nrich.maths.org/4938 Our Sports https://nrich.maths.org/7779 How Big Are Classes 5, 6 and 7? https://nrich.maths.org/2399
Statistics: Solving 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. **Summer 1**	□ 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. **Spring 1**
NRich		In The Playground https://nrich.maths.org/7248	

NCETM reasoning		**True or false?** (Looking at a simple pictogram) "More people travel to work in a car than on a bicycle". Is this true or false? Convince me. Make up you own 'true/false' statement about the pictogram **What's the same, what's different?** Pupils identify similarities and differences between different representations and explain them to each other	**True or false?** (Looking at a bar chart) "Twice as many people like strawberry than lime". Is this true or false? Convince me. Make up your own 'true/false' statement about the bar chart. **What's the same, what's different?** Pupils identify similarities and differences between different representations and explain them to each other. **Create a question** Pupils ask (and answer) questions about
		Create questions. Pupils ask (and answer) questions about different statistical representations using key vocabulary relevant to the objectives.	different statistical representations using key vocabulary relevant to the objectives.