Year 6 Autumn Term	
Block 1 Place Value	
Step 1 Numbers to 1,000,000	In preparation for the next step (Numbers to 10,000,000), children recap their Year 5 learning by exploring numbers up to 1,000,000 Understanding that place value columns follow consistent patterns – ones, tens, hundreds, then (one) thousands, ten thousands, hundred thousands, before reaching millions – is key. Place value charts, Gattegno charts and place value counters can be used to support understanding of the relationships between columns and the construction of numbers. Children also revise partitioning, exploring both standard and non-standard ways of composing numbers. Writing numbers in words follows in Step 3
Step 2 Numbers to 10,000,000	Children build on the previous step to explore numbers up to 10,000,000. They need to understand that the million can be considered a unit in the same way as the thousand. Numbers do not all have to be over 1,000,000 in this step; children should continue to experience smaller numbers alongside 7-digit numbers. The placement of commas and other separators should be discussed. Familiar manipulatives and models, such as place value charts and counters, Gattegno charts and part-whole models, are used to represent numbers. Children partition the numbers in both standard and non-standard ways.
Step 3 Read and write numbers to ten million	Children should now be secure with the place value of numbers to 10,000,000. This small step develops their skill at reading and writing large numbers in words. The focus of this step is learning the structure of how numbers are said and written in words, for example 4,378 as "four thousand, three hundred and seventy-eight" rather than just "four-three-seven-eight". Using a comma as a separator helps children to read and write large numbers by tackling them in sections. This can be supported visually/ concretely with place value charts, part-whole models or Gattegno charts. Children should also be able to write numbers such as "half a million" in both words and numerals.
Step 4 Powers of 10	Children should be confident with multiplying and dividing by 10, 100 and 1,000 from their learning in Year 5. In this small step, they use their place value knowledge to identify integers that are 10, 100, 1,000 times the size, or one-tenth, one-hundredth, one-thousandth the size of other integers. These relationships with decimal numbers are covered next term. Children need to be aware that a value increases or decreases by a power of 10 between adjacent columns on a place value chart. They also need to realise that multiplying or dividing by 10 twice has the same effect as multiplying or dividing by 100 and that multiplying or dividing by 10 three times has the same effect as multiplying or dividing by 1,000 Place value charts and Gattegno charts are useful for modelling the effects of repeated multiplication and division by powers of 10.
Step 5 Number line to ten million	Children explore the number line to 10,000,000 using the unit of a million, making links to the familiar number lines to 10 and 10,000. They label partially filled number lines, identify points labelled on number lines and mark where a given number would lie on a number line. Children should understand that half a million is equal to 500,000 and know that the midpoints between divisions on the number line to 10,000,000 can be written as, for example, "three and a half million" or "3,500,000". This links to splitting different numbers and number lines into two, four, five and ten parts, which is also covered in this step.
Step 6 Compare and order any integers	In Year 5, children learned how to compare and order integers up to 1,000,000. This small step extends their learning to integers up to 10,000,000 Children compare numbers with the same number of digits, and with different numbers of digits, using their knowledge of place value columns. They present numbers in a variety of forms and use these different representations to aid their understanding when comparing and ordering. Encourage the use of inequality symbols and precise mathematical language such as "greater than" and "less than".
Step 7 Round any integer	In Year 5, children learned to round any number up to 1,000,000 to any power of 10 up to 100,000. This small step reviews and builds on this concept so that children also learn to round to the nearest million. Children need to be confident with identifying the previous and next multiples of the appropriate power of 10 of the number, and finding the midpoints of those multiples. Number lines are useful as support here, as children can identify which multiple the number is closer to. Children may need reminding that when a number is exactly halfway between two successive multiples the convention is to round to the greater multiple.
Step 8 Negative numbers	Children encountered negative numbers in Year 5. The focus of this small step is using negative numbers in real-life contexts while reinforcing children's understanding of the number line extending beyond zero. Both horizontal and vertical number lines should be used, with the vertical line linking to reading temperatures on a thermometer. As well as adding and subtracting from positive and negative numbers, children learn to find the difference between numbers, including calculating intervals across zero. At this stage, children do not need to subtract negative numbers, so there is no need to cover calculations of the form 7 – –5.
Block 2 Addition, subtraction, multiplication and division	
Step 1 Add and subtract integers	This small step reviews and extends children's learning of how to add and subtract integers with any number of digits. Children use the formal column method for numbers with the same and different numbers of digits. They also practise mental strategies with both large and small numbers, using their understanding of place value. Children solve multi-step problems, choosing which operations and methods to use based on the context of the problem and the types of numbers involved. The use of concrete manipulatives can support children's understanding, especially where exchanges are required.

Step 2 Common factors	This small step reinforces children's understanding of factors and common factors, introduced in Years 4 and 5 respectively. Some children may still choose to use arrays and other representations, but knowledge of times-tables and the use of familiar rules of divisibility are to be encouraged. The rules of divisibility will be reviewed again later in the block. Children work systematically to find the complete list of factors of a number, and learn to use their knowledge that factors usually come in pairs to spot missing factors. Children are not required to formally identify the highest common factor of two or more numbers, but can be extended to consider this idea.
Step 3 Common multiples	Children are familiar with the idea of multiples of numbers from earlier study of times-tables. Building on this knowledge, they now find common multiples of two or more numbers. As with factors, arrays and other representations may still be used as support, but knowledge of times-tables is key. Some multiples can be recognised using the rules of divisibility, which are explored in detail in the next small step. Encourage children to work systematically to find lists of multiples rather than just finding the product of the given numbers, as this may miss some multiples. Children do not need to be able to formally identify the lowest common multiple of two or more numbers, but can be challenged to consider the first common multiple of a pair of numbers.
Step 4 Rules of divisibility	Children should be familiar with most rules of divisibility from looking at patterns in times-tables in their earlier learning and the previous two steps. Children recognise divisibility by 2, 5 or 10 by looking at the ones digits of a number. They know a number is divisible by 4 if halving the number gives an even result and the corresponding rule for divisibility by 8. They know that numbers are divisible by 3 if the sum of their digits is divisible by 3, and divisible by 9 if the sum of their digits is divisible by 9 Children now learn to combine these rules to deal with other potential factors, for example to be divisible by 6 a number must be divisible by both 2 and 3 Children should recognise that a 2-digit number is divisible by 11 if the digits are the same.
Step 5 Primes to 100	Children first encountered prime numbers and composite numbers in Year 5. This small step reviews that learning and develops children's knowledge of factors so that they can deepen their understanding of prime numbers. Children recognise that a number is prime when it has exactly two factors: 1 and itself. They also look at identifying the prime factors of a given number. By the end of this step, children should be able to identify all the primes less than 100 and recall at least the primes to 19 Children should be familiar with square and cube numbers from earlier years, so this is something that can be revisited here, but is also covered in detail in the next small step.
Step 6 Square and cube numbers	Children encountered square and cube numbers in Year 5, and this small step revisits that learning and the notation for squared (2) and cubed (3). The concept of square and cube numbers can be supported by making links to area and volume (the formula for the volume of a cuboid will be covered next term). Children explore the factors of square and cube numbers, noticing that square numbers always have an odd number of factors, but cube numbers can have an odd or even number of factors. The vocabulary of earlier small steps in this block, such as "factor", "multiple" and "prime" can also be reinforced at this stage
Step 7 Multiply up to 4DN by 2DN	Building on their learning from previous years, children use long multiplication to multiply numbers with up to four digits by 2-digit numbers. Children should already be aware that multiplication is commutative, so answers to calculations such as 56 × 1,234 can be found by rewriting as 1,234 × 56 and using the standard format. Children also solve word problems and/or multi-step problems. This will be revisited in the next step, where alternative strategies are also explored, for example for multiplying by 9 or 99 Children who require additional support may benefit from revising multiplication of 2- or 3-digit numbers by a single digit before moving on to multiplication by a 2-digit number.
Step 8 Solve problems with multiplication	In this small step, children use the column method for multiplication and explore alternative strategies for solving multiplication problems, including word problems. Children use their knowledge of multiplying by powers of 10 and adjust calculations: for example, instead of multiplying a number by 99, they multiply the number by 100 and then subtract the number from the product. Children explore using factors to find the answers to multiplication problems, such as multiplying by 5 and then by 7 as an alternative to multiplying by 35. This is a useful strategy for children who have good times-table knowledge but make errors with the algorithm for long multiplication.
Step 9 Short division	In Year 5, children built on earlier learning of short division and learned to divide numbers with up to four digits by single-digit numbers. This small step reinforces all this earlier learning in preparation for the upcoming steps on long division. Children perform short divisions both with integer answers and where there is a remainder. They interpret the remainder in context, for example knowing that "4 remainder 1" could mean 4 complete boxes with 1 left over so 5 boxes will be needed. Children may need to list multiples of the number they are dividing by to help them if their times-table knowledge is not secure.
Step 10 Division using factors	In this small step, children build on their understanding of using factors in multiplication and learn to divide by a 2-digit number using repeated division. Children start with the familiar strategy that to divide by 4 they can halve and halve again. They move on to dividing by multiples of 10 before looking at slightly more complex divisions using two single-digit factors. It may be worth revising what factor pairs are and practising finding factor pairs of 2-digit numbers. Children need to be aware that the divisions can be carried out in any order. This means they can choose to divide first by the factor they find it easier to work with, and then by the factor they find more difficult.

Step 11 Introduction to long division	In this small step, children are introduced to long division as a different method for dividing by a 2-digit number, now including numbers that cannot be factorised into single-digit numbers. Children divide 3-digit numbers without remainders, using an expanded method that shows the multiples, before progressing to a more formal long division method. They divide 4-digit numbers, still without remainders, using their knowledge of multiplying by 10 and 100. When dividing by composite numbers, it may be worth comparing the long division method with the method of division using factors covered in the previous small step. Long division with remainders is covered in the next small step.
Step 12 Long division with remainders	Now that children have learned to use the algorithm for long division with integer answers, they move on to long divisions with remainders. This small step includes context questions where children interpret the remainder and/or adjust the number they are dividing. For example, when thinking about packing items into boxes, they consider the number of full boxes or the total number of boxes needed. Children should always check that the remainder is less than the number they are dividing by. They can use estimation as a sense-check for their answers, for example 834 ÷ 18 is close to 800 ÷ 20 so the answer should be in the region of 40.
Step 13 Solve problems with division	In this small step, children explore division problems, looking at the most appropriate strategy for finding a solution. As well as providing an opportunity to revisit the learning of the last few steps, children look at alternative methods such as partitioning the number into appropriate multiples of the number they are dividing by. They also use counting up in multiples, for example for calculations such as 1,400 ÷ 200, and compare this with other strategies. Encourage children to think about the numbers in a division question and to consider alternative strategies before they launch into a formal method. Later in this block, children explore using known division facts to find other division or multiplication facts.
Step 14 Solve multi-step problems	In this small step, children apply the skills they have developed so far in this block to solving problems in real-life contexts. The problems involve more than one calculation and children must decide which operations they need to perform and in what order to perform them; this will need careful modelling. As the focus of the step is making the correct choice of operation, calculators can be provided or the numbers simplified if necessary. Children should be encouraged to think about the best way to perform any of the calculations and use the most appropriate written, informal or mental method. For example, this might include using a number line to work out a subtraction after a long multiplication
Step 15 Order of operations	In this small step, children learn the order of priority for operations in a calculation: that calculations in brackets should always be done first, and that multiplication and division have equal priority and should be performed before additions and subtractions.
Step 16 Mental calculations and estimations	Children should use mental strategies and estimation whenever appropriate, and several examples have been included throughout the block. This small step reminds children of the importance of mental strategies and estimation, and gives them an opportunity to revisit and extend their learning from this block and previous years. Children should be aware that estimating the answer of a calculation serves as a sense-check on whether their answer is correct, and this can be done either before or after a calculation. The numbers they choose when performing estimates should be simple enough for this to be done mentally. Links should be made back to previous learning on rounding when simplifying numbers within a calculation.
Step 17 Reason from known facts	In this small step, children work out other facts from a given fact using their knowledge of place value, inverse operations, commutativity and the mental strategies practised in this block, particularly in the previous small step. Using diagrams, including area models and number lines, can help children to see the links between the different calculations. They need to be confident in multiplying and dividing by powers of 10. Children also explore the idea of doubling and halving. It is important that children can not only work out an answer of a related fact, but also explain the connections between calculations that helped them arrive at this answer. This small step will focus on integers, and decimal calculations will be covered in Spring Block 3.
Block 3 Fractions A	
Step 1 Equivalent fractions and simplifying	In this small step, children build on prior knowledge of equivalent fractions to recognise when fractions are, and are not, in their simplest form. Children use their understanding of common factors to simplify fractions. They learn that when the numerator and denominator have no common factors greater than 1, the fraction is in its simplest form. The step begins with fractions with one common factor (greater than 1) and moves on to fractions with several common factors. Children are encouraged to look for the greatest possible number to divide by, but also understand that simplification can be performed in more than one step. Pictorial representations and fraction walls can be used to support understanding.
Step 2 Equivalent fractions on a number line	In this small step, children use number lines to count forwards and backwards in fractions and to find equivalent fractions. Children start by revising counting fractions above 1 on a number line to ensure they are able to count in fractions accurately. Using a number line clearly shows that finding equivalent fractions does not change the value of the fraction. Encourage children to draw extra intervals on number lines to support them in placing the fractions. Number lines can also be used to support children in finding the difference between fractions. This will be revised later in the block when adding and subtracting fractions. Encourage children to spot patterns on number lines when simplifying, rather than thinking about fractions individually.

Step 3 Compare and order (denominator)	In this small step, children compare and order fractions with the same denominator. Building on the skills covered in the previous steps, they first need to use their knowledge of equivalent fractions to find a common denominator in order to compare. Children begin by using bar models to help compare fractions. They first work with pairs of fractions where one denominator is a multiple of the other, building on learning from Year 5. They then look at pairs of fractions where the denominators are not multiples of each other, using their knowledge of multiples and common multiples. Encourage children to find the first common multiple, but allow them to explore different methods. Once children are confident expressing fractions with a common denominator, they use this to order fractions.
Step 4 Compare and order (numerator)	In the previous small step, children compared and ordered fractions using a common denominator. They now compare and order fractions with the same numerator. Bar models are a useful representation to explore fractions with the same numerator, starting with unit fractions and then moving on to non-unit fractions. This will lead to the understanding that if the numerators are the same, then the greater the denominator, the smaller the fraction. Children could visualise or place fractions on a number line and think about whether it is greater than or less than 1/2 or if it is close to 0 or 1. Understanding can then be built on to compare fractions greater than 1 Children should consider whether it is more efficient to find a common numerator or a common denominator.
Step 5 Add and subtract simple fractions	Before beginning, it may be appropriate to revise adding and subtracting fractions with the same denominator to remind children that where the denominators are the same, they need to add/ subtract the numerators and leave the denominator unchanged. In this small step, children build on previous learning in this block and Year 5 to use equivalent fractions to add and subtract fractions where one denominator is a multiple of the other. Children may be familiar with some common additions and subtractions such as 1/2 + 1/4 = 3 4 and this is a good example on which to build. They start by using bar models before moving on to finding the first common multiple of the denominators. As the focus is on addition and subtraction of simple fractions, children are not yet required to work with improper fractions and mixed numbers as this will be looked at later in the block.
Step 6 Add and subtract two fractions	Following on from the previous small step, children add and subtract fractions where the denominators are not multiples of each other. Children may need to revisit how to find a common denominator before completing the calculations. They use bar models and then move on to finding the first common multiple of the denominators. Once this is secure, they add up to three fractions or subtract fractions with different denominators. Children add fractions with answers greater than one, but do not add and subtract mixed numbers until the next step. Encourage children to simplify answers and convert improper fractions to mixed numbers as appropriate.
Step 7 Add mixed numbers	Children encountered mixed numbers in the answers to additions in the previous small step. They now add two mixed numbers, building on their experience of this in Year 5 Children explore adding the wholes and fractional parts separately. This is usually the most efficient method, but converting to improper fractions and then adding is an alternative. Some children may need to revisit converting between improper fractions and mixed numbers. Questions begin with fractions with the same denominator and then move on to fractions with different denominators. Children can still draw models to represent adding fractions, particularly if these are useful for pairs of fractions with unequal denominators.
Step 8 Subtract mixed numbers	In this small step, children subtract two mixed numbers, building on the learning from Year 5. Children make links between what is the same and what is different when subtracting mixed numbers compared to adding them. To introduce this step, children subtract mixed numbers that have the same denominator and do not break the whole. They then subtract fractions with different denominators and complete questions that break the whole. When breaking the whole, children can exchange one whole or convert mixed numbers to improper fractions. Bar models are useful tools to illustrate both methods, and number lines can be used to help find the difference.
Step 9 Multi-step problems	In this small step, children apply the skills they have learnt in previous steps to solving problems in real-life contexts. The problems may involve more than one calculation and children need to choose the operations and consider what order to perform them in; this will need careful modelling. Encourage children to think about the most appropriate method to perform any of the calculations. Sharing methods could help children gain a flexible approach to solving the problems. Children also need to ensure that they write fractions in their simplest form and convert between improper fractions and mixed numbers where appropriate.
Block 4 Fractions B	
Step 1 Multiply fractions by integers	Building on their learning in Year 5, this small step provides practice in multiplying fractions and mixed numbers by integers. A variety of representations can show that multiplying fractions by integers is the same as repeated addition of a fraction. As when adding and subtracting fractions, the denominator does not change. Children recognise that they need to multiply the numerator by the integer. When multiplying mixed numbers, children can either partition them into wholes and parts, multiplying each of them by the integer, or convert the mixed number to an improper fraction and then multiply the numerator by the integer.
Step 2 Multiply fractions by fractions	Building on the previous step, children multiply a fraction by another fraction. Children use concrete and pictorial representations to support them, including folding paper, diagrams and bar models. By exploring the pictorial representations, children identify the fact that fractions can be multiplied by multiplying both

	the numerators and denominators. They may need to be reminded that answers should be given in their simplest form. As the fractions children multiply in this step are all proper, they could be stretched to explain why their answer is always smaller than the fractions given in the question.
Step 3 Divide fractions by an integer	In this small step, children are introduced to dividing fractions by integers for the first time. They focus on dividing fractions where the numerator is a multiple of the integer they are dividing by, for example 3/5 divided by 3, or 6/7 divided by 2 Bar models are used initially to represent fractions and to explore how to divide a fraction by an integer. Children complete the number sentence alongside the representation to encourage them to notice that the denominator stays the same and the numerator is divided by the integer. The idea of unitising could be used to support children with dividing fractions by integers. For example, if they know that 6 ones shared between 2 is equal to 3 ones, and 6 eggs shared between 2 is equal to 3 eggs, then 6 sevenths shared between 2 is equal to 3 sevenths. Links can be made to previous representations when multiplying fractions, for example by looking at the equivalence of 4/7 ÷ 2 and 4/7 × 1
Step 4 Divide any fraction by an integer	In this small step, children build on their learning from the previous step to divide fractions where the numerator is not a multiple of the integer they are dividing by. Children continue to use models and draw diagrams to divide fractions into equal parts. There are two methods that children could use throughout this step. They could use their prior knowledge of equivalent fractions combined with learning from the previous step to find an equivalent fraction where the numerator is a multiple of the integer they are dividing by. Alternatively, through the use of diagrams, children could explore the link between multiplying by a unit fraction and dividing by an integer. When using this method, children should be encouraged to spot the pattern that the numerator stays the same and the denominator is multiplied by the integer. Encourage children to compare methods and decide which is more efficient, and why.
Step 5 Mixed questions with fractions	Children have now used all four operations with fractions in isolation. In this small step, children identify the appropriate operation(s) to use in a given situation. Bar models are used to explore word problems and to support children in selecting the correct operation(s). Children start by choosing the correct single operation to solve a problem and move on to explore multi-step problems using all four operations. This step provides a good opportunity to revisit learning from earlier in the year. They can consolidate their knowledge of the order of operations, and also topics such as measure from earlier years.
Step 6 Fractions of an amount	In Year 5, children used bar models to pictorially represent unit and non-unit fractions of an amount. The main focus of this small step is on understanding that the denominator is the number of parts the whole is divided into, and the numerator represents the number of those parts that are selected. Bar models are a useful way for children to realise the connection between parts and wholes of an amount. By the end of this step, children should be able to find fractions of an amount in different contexts. Encourage them to divide by the denominator and multiply by the numerator, understanding why they are doing this and what they are finding in each step
Step 7 Fraction of an amount- find the whole	In the previous step, children found a fraction of an amount. In this small step, they find the whole amount given a fraction of it. Using a bar model to represent the parts and the whole is a useful support to children when working through this step. When finding the whole from a unit fraction, a pictorial representation helps children to understand why they simply need to multiply the given amount by the denominator. They then find a unit fraction from a given non-unit fraction and use this to find the whole. Draw attention to the fact that, when calculating the whole, their answer will be greater than the number in the question. This will help children to sense check their answer. Fluency with times-tables facts is very helpful here; some children may need a times-table square as support.
Block 5 Converting Units	
Step 1 Metric measures	Building on their experiences from earlier years, children recognise, read and write all metric measures for length, mass and capacity. This is the first time they will be introduced to tonnes as a measure for mass. Highlight the difference between capacity (the amount an object can contain) and volume (the amount actually in an object). Children consider the most appropriate unit of measure and develop their estimation skills in context. Although metric units of measurement are used throughout, children may mention imperial units of measurement. The relationship between metric and imperial units will be explored later in the block. Refer to the mass of an object, rather than its weight. The mass remains constant, whereas the weight of an object depends on the effect of gravity.
Step 2 Convert metric measures	In previous years, children learnt how to multiply and divide numbers by 10, 100 and 1,000. In Year 5, children learnt how to convert between metric measurements of length and mass. This small step recaps this learning and also introduces conversions between metric measurements for capacity. Children convert between units both ways, for example from metres to centimetres and centimetres to metres. When making these conversions, children may need to be reminded about decimal place value. When comparing measurements with different units, children need to convert them to the same unit. During this small step, highlight the inverse relationship between multiplication and division. It is important that children understand the role of zero as a place value holder when performing some calculations.
Step 3 Calculate with metric measures	Building on the previous step, children use and apply their conversion skills to solve measurement problems in context. The use of pictorial representations, such as bar models and number lines, to represent the problem helps children to choose the correct operation(s) to solve the problem. Children need to be secure with the

	four operations to find the correct numerical answers. Some of the problems involve finding a fraction of an amount (covered earlier this term) and adding and subtracting decimals, which will be revisited in the Spring Term.
Step 4 Miles and kilometres	In Year 5, children explored the relationship between some imperial and metric units of measurement. This small step focuses on the relationship between miles and kilometres. Children need to know that one mile is a greater distance than one kilometre. They learn that 5 miles is approximately equal to 8 km. Using this fact, they solve conversions from miles to kilometres and from kilometres to miles. Children need to know that the symbol "≈" means "is approximately equal to". To provide context, distances measured in miles in the UK could be compared to distances measured in kilometres in Europe.
Step 5 Imperial measures	In this small step, children continue to explore imperial measures and the relationships between imperial and metric measures. Children need to know and use the following facts: • 1 inch ≈ 2.5 cm • 1 foot = 12 inches • 1 pound = 16 ounces • 1 stone = 14 pounds • 1 gallon = 8 pints They use these facts to perform related conversions, both within imperial measures and between imperial and metric measures. Attention should be drawn to the fact that the conversion between inches and cm is approximate while the others are exact.