Year 5: Autumn Medium Term Plan:

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value			Number: Addition and Subtraction		Statistics		Number: Multiplication and Division		Measurement: Perimeter and Area		Consolidation

Number: Place Value **NC Objectives:** **•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** **•Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers including through zero.** **•Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000** **•Solve number problems and practical problems that involve all of the above.** **•Read Roman numerals up to 1,000 (M) and recognise years written in Roman numerals.**				
Week	**Small step**	**Key Questions**	**Notes and Guidance**	**Assessment**
	Numbers to 10,000	Can you show me 8,045 (any number) in three different ways? Which representation is the odd one out? Explain your reasoning. What number could the arrow be pointing to? Which column(s) change when adding 10, 100, 1,000 to 2,506?	Children use concrete manipulatives and pictorial representations to recap representing numbers up to 10,000 Within this step, children must revise adding and subtracting 10, 100 and 1,000 They discuss what is happening to the place value columns, when carrying out each addition or subtraction.	
	Roman Numerals to 1,000	Why is there no zero in Roman Numerals? Do you notice any patterns in the Roman number system? How can you check you have represented the Roman Numeral correctly?	Building on their knowledge of Roman Numerals to 100, from Year 4, children explore Roman Numerals to 1,000 They explore what is the same and what is different about the number systems,	

		Can you use numbers you know, such as 1, 10 and 100 to help you?	for example there is no zero in the Roman system. Writing the date in Roman Numerals could be introduced and so this concept can be revisited every day.	
	Round to nearest 10, 100 and 1,000	Which place value column do we need to look at when we round to the nearest 1,000? When is it best to round to the nearest 10? 100? 1,000? Can you give an example of this? Can you justify your reasoning? Is there more than one solution? Will the answers to the nearest 100 and 1,000 be the same or different for the different start numbers?	Children build on their knowledge of rounding to 10, 100 and 1,000 from Year 4. They need to experience rounding up to and within 10,000 Children must understand that the column from the question and the column to the right of it are used e.g. when rounding 1,450 to the nearest hundred – look at the hundreds and tens columns. Number lines are a useful support.	
	Number to 100,000	How can the place value grid help you to add 10, 100 or 1,000 to any number? How many digits change when you add 10, 100 or 1,000? Is it always the same number of digits that change? How can we represent 65,048 on a number line? How can we estimate a number on a number line if there are no divisions? Do you need to count forwards and backwards to find out if a number is in a number sequence? Explain.	children focus on numbers up to 100,000 They represent numbers on a place value grid, read and write numbers and place them on a number line to 100,000 Using a number line, they find numbers between two points, place a number and estimate where larger numbers will be.	
	Compare and order numbers to 100,000	In order to compare numbers, what do we need to know? What is the value of each digit in the number 63,320? What is the value of _____ in this number?	Children will compare and order numbers up to 100,000 by applying their understanding from Year 4 and how numbers can be represented in different ways.	

		What is the value of the whole? Can you suggest other parts that make the whole? What number does MMXVII represent?	Children should be able to compare and order numbers presented in a variety of ways, e.g. using place value counters, part-whole models, Roman numerals etc.	
	Round numbers within100,000	Why would we round the se distances to the nearest 1,000 miles? When is it best to round to 10? 100? 1,000? Can you give an example of this? Can you justify your reasoning?	Children continue to work on rounding, now using numbers up to 100,000 Children use their knowledge of multiples of 10, 100, 1,000 And 10,000 to work out which two numbers the number they are rounding sits between. A number line is a good way to visualise which multiple is the nearest. Children may need reminding of the convention of rounding up if numbers are exactly halfway.	
	Numbers to a million	If one million is the whole, what could the parts be? Show me 800,500 represented in three different ways. Can 575,400 be partitioned into 4 parts in a different way? Where do the commas go in the numbers? How does the place value grid help you to represent large numbers? Which columns will change in value when Eva adds 4 counters to the hundreds column?	Children read, write and represent numbers to 1,000,000 They will recognise large numbers represented in a part-whole model, when they are partitioned in unfamiliar ways. Children need to see numbers represented with counters on a place value grid, as well as drawing the counters.	
	Counting in 10s, 100s, 1,000s,10,000s, and 100,000s	Will there be any negative numbers in this sequence? What pattern do you begin to see with the positive and negative numbers in the sequence?	Children complete number sequences and can describe the term-to-term rule e.g. add ten each time. It is important to include sequences that go down as well as those that go up.	

		What patterns do you notice when you compare sequences increasing or decreasing in 10s, 100s, 1,000s etc.? Can you create a rule for the sequence?	They count forwards and backwards in powers of ten up to 1,000,000	
	Compare and order numbers to one million	What do we need to know to be able to compare and order large numbers? Why can't we just look at the thousands columns when we are ordering these five numbers? What is the value of each digit? What is the value of ____ in this number? What is the value of the whole? Can you suggest other parts that make the whole? Can you write a story to support your part-whole model?	Children compare and order numbers up to 1,000,000 using comparison vocabulary and symbols. They use a number line to compare numbers, and look at the importance of focusing on the column with the highest place value when comparing numbers.	
	Round numbers to one million	why are we rounding these populations to the nearest 100,000? Can you partition the number _____ in different ways? Which digits do you need to look at when rounding to the nearest 10? 100? 1,000? 10,000? 100,000? How do you know which has the greatest value? Show me.	Children use numbers with up to six digits, to recap previous rounding, and learn the new skill of rounding to the nearest 100,000 They look at cases when rounding a number for a purpose, including certain contexts where you round up when you wouldn't expect two e.g. to pack 53 items in boxes of 10 you would need 6 boxes.	
	Negative numbers	Do we include zero when counting backwards? Which is the coldest/warmest temperature? How can we estimate where a number goes on this number line? Does it help to estimate where zero goes first? Why? What was the temperature	Children continue to explore negative numbers and their position on a number line. They need to see and use negative numbers in context, such as temperature, to be able to count back through zero. They may need to be reminded to call them negative numbers	

		increase/decrease?. Can you show how you know the increase/decrease on a number line?	e.g. “negative four” rather than “minus four”.	

Addition and Subtraction **NC Objectives:** **•Add and subtract numbers mentally with increasingly large numbers.** **•Add and subtract whole numbers with more than 4digits, including using formal written methods (columnar addition and subtraction).** **•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 whole numbers more the 4 digits	Will you have to exchange? How do you know which columns will be affected? Does it matter that the two numbers don’t have the same amount of digits? Which number goes on top in the calculation? Does it affect the answer?	Children will build upon previous learning of column addition. They will now look at numbers with more Than four digits and use their place value knowledge to line the numbers Up accurately. Children use a range of manipulatives to demonstrate their understanding and use pictorial representations to support their problem solving.	
	Subtract whole numbers more the 4 digits	Why is it important that we start subtracting the smallest place value first? Does it matter which number goes on top? Why? Will you have to exchange? How do you know which columns will Be affected? Does it matter that the two numbers don’t have the same amount of digits?	Building on Year 4 experience, children use their knowledge of subtracting using the formal column method to subtract numbers with more than four digits. Children will be focusing on exchange and will be concentrating on the correct place value. It is important that children know when an exchange is and isn’t needed. Children need to experience ‘0’ as a place holder.	
	Round to	Which numbers shall I round to?	Children build on their understanding of	

	estimate and approximate	Why should I round to this number? Why should an estimate be quick? When, in real life, would we use an estimate?	estimating and rounding to estimate answers for calculations and problems. The term approximate is used throughout. Encourage children to consider the most appropriate number to round to e.g. the nearest ten, hundred or thousand. Reinforce the idea that an estimate should be performed quickly by choosing much easier numbers.	
	Inverse Operations	How can you tell if your answer is sensible? What is the inverse of addition? What is the inverse of subtraction?	In this small step, children will use their knowledge of addition and subtraction to check their workings to ensure accuracy. They use the commutative law to see that addition can be done in any order but subtraction cannot.	
	Multi- step Problem	What is the key vocabulary in the question? What are the key bits of information? Can we put this information into a model? Which operations do we need to use?	In this small step children will be using their knowledge of addition and subtraction to solve multi-step problems. The problems will appear in different contexts and in different forms i.e. bar models and word problems.	

Statistics:

NC Objectives:

- **Solve comparison, sum and difference problems using information presented in a line graph.**
- **Complete, read and interpret information in tables including timetables.**

	Read & Interpret Line Graph	How can we use a ruler to support us to read values from a line graph? Where do we see examples of line graphs in real life? How is the line graph different to a bar chart? How is it the same? How can we estimate the value between intervals? Does it matter if we are not perfectly accurate? Why?	Children read and interpret line graphs. They make links back to using number lines when reading the horizontal and vertical axes. Children can draw vertical and horizontal lines to read the points accurately. Encourage children to label all the intervals on the axes to support them in reading the line graphs accurately. When reading between intervals on a line graph, children can give an estimate of the value that is represented.	
	Draw Line Graphs	On the rainfall graph, if the vertical axis went up in intervals of 5 mm, would the graph be more or less accurate? Why? What scale will you use for the rupees on the conversion graph? Which axis will you use for the pounds on the conversion graph? Explain why you have chosen this axis. How can we use multiples to support our choice of intervals on the vertical axis?	Children use their knowledge of scales and coordinates to represent data in a line graph. Drawing line graphs is a Year 5 Science objective and has been included here to support this learning and link to reading and interpreting graphs. Children draw axes with different scales depending on the data they are representing. Encourage children to collect their own data to present in line graphs focusing on accurately plotting the points.	
	Problems with Line Graphs	How does drawing vertical and horizontal lines support me in reading the line graph? How will you plan out your own heart rate experiment? What information will you need to gather? What unit will you measure in? How will you label your axes? Can we measure the temperature in our classroom? How could we gather the data?	Children use line graphs to solve problems. They use prepared graphs or graphs which they have drawn themselves, and make links to other subjects, particularly Science. Children solve comparison, sum and difference problems. They can also	

		How could we present the data?	generate their own questions for others to solve by reading and interpreting the line graphs.	
	Read & Interpret Tables	Why are column and row headings important in a table? If I am finding the difference, what operation do I need to use? Can you think of your own questions to ask about the information in the table? Why is it important to put units of measure in the table?	Children read tables to extract information and answer questions. There are many opportunities to link this learning to topic work within class and in other subject areas. Encourage children to generate their own questions about information in a table. They will get many opportunities to apply their addition and subtraction skills when solving sum and difference problems.	
	Two-way Tables	Which column do I need to look in to find the information? Which row do I need to look in to find the information? How can I calculate the total of a row/column? If I know the total, how can I calculate any missing information? Can you create your own two-way table using information about your class?	Children read a range of two-way tables. These tables show two different sets of data which are displayed horizontally and vertically. Children answer questions by interpreting the information in the tables. They complete two-way tables, using their addition and subtraction skills. Encourage children to create their own questions about the two-way tables.	
	Timetables	Where do you see timetables and why are they useful? What information is displayed in a row when you read across the timetable? What information is displayed in a column when you read down the timetable? Why is it important to use 24-hour clock or a.m./p.m. on a timetable?	Children read timetables to extract information. Gather local timetables for the children to interpret to make the learning more relevant to the children's lives, this could include online timetables. Revisit children's previous learning on digital time to support them in reading timetables more accurately. Consider	

			looking at online apps for timetables to make links with ICT.	

Multiplication and Division **NC Objectives:** **•Multiply and divide numbers mentally drawing upon known facts.** **•Multiply and divide whole numbers by 10, 100 and 1000.** **•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 (2) and cubed (3)** **•Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes.** **•Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.** **•Establish whether a number up to 100 is prime and recall prime numbers up to 19**				
	Multiples	What do you notice about the multiples of 5? What is the same about each of them, what is different? Look at multiples of other numbers, is there a pattern that links them to each other? Are all multiples of 8 multiples of 4? Are all multiples of 4 multiples of 8?	Building on their times tables knowledge, children will find multiples of whole numbers. Children build multiples of a number using concrete and pictorial representations e.g. an array. Children understand that a multiple of a number is the product of the number and another whole number. Multiplying decimal numbers by 10, 100 and 1,000 forms part of Year 5 Summer block 1.	
	Factors	How can you work in a systematic way to prove you have found all the factors? Do factors always come in pairs? How can we use our multiplication and division facts to find factors	Children understand the relationship between multiplication and division and use arrays to show the relationship between them. Children learn that factors of a number multiply together to give that number, meaning that factors come in pairs. Factors are the whole numbers that you multiply	

			together to get another whole number (factor ×factor =product).	
	Common Factors	How can we find the common factors systematically? Which number is a common factor of a pair of numbers? How does a Venn diagram help to show common factors? Where are the common factors?	Using their knowledge of factors, children find the common factors of two numbers. They use arrays to compare the factors of a number and use Venn diagrams to show their results.	
	Prime Numbers	What is a prime number? What is a composite number? How many factors does a prime number have?	Using their knowledge of factors, children see that some numbers only have two factors. They are taught that these are numbers called prime numbers, and that non-primes are called composite numbers. Children can recall primes up to 19 and are able to establish whether a number is prime up to 100. Using primes, they break a number down into its prime factors. Children learn that 1 is not a prime number because it does not have exactly two factors (it only has 1 factor).	
	Cube Numbers	Why are cube numbers called 'cube' numbers? How are squared and cubed numbers similar? How are they different? True or False: cubes of even numbers are even and cubes of odd numbers are odd.	Children learn that a cube number is the result of multiplying a whole number by itself three times e.g. 6 ×6 ×6 If you multiply a number by itself, then itself again, the result is a cube number.	

	Multiply by 10, 100 and 1,000	How many places do you move to the left? When we have an empty place value column to the right of our digits what number do we use as a place holder? Can you use multiplying by 100 to help you multiply by 1,000? Explain why.	Children recap multiplying by 10 and 100 before moving on to multiplying by 1,000 They look at numbers in a place value grid and discuss the number of places to the left digits move when you multiply by different multiples of 10	
	Divide by 10, 100 and 1,000	Which direction do the counters move? How many columns do they move? How do you know how many columns to move? What number do we have now?	Children look at dividing by 10, 100 and 1,000 using a place value chart. They use counters and digits to learn that the digits move to the right when dividing by powers of ten. They develop understanding of how many places to the right to move the counters to the right.	
	Multiples of 10, 100 and 1,000	If we are multiplying by 20, can we break it down into two steps and use our knowledge of multiplying by 10? How does using multiplication and division as the inverse of the other help us to use known facts?	Children have been taught how to multiply and divide by 10, 100 and 1,000 They now use knowledge of other multiples of 10, 100 and 1,000 to answer related questions.	

Perimeter and Area

NC Objectives:

- **Measure and calculate the perimeter of composite rectilinear shapes in cm and m.**
- **Calculate and compare the area of rectangles (including squares), and including using standard units, cm^2, m^2estimate the area of irregular shapes**

	Measure Perimeter	What is perimeter of a shape? What's the same/different about these shapes? Do we need to measure every side? Once we have measured each side, how do we calculate the perimeter?	Children measure the perimeter of rectilinear shapes from diagrams without grids. They will recap measurement skills and recognise that they need to use their ruler accurately in order to get the correct answer.	
	Calculate Perimeter	How can you use the labelled sides to find the length of the unknown sides? What strategies can you use to calculate the total perimeter? What does regular mean? Why are rectangles irregular?	Children apply their knowledge of measuring and finding perimeter to find the unknown side lengths. They find the perimeter of shapes with and without grids. When calculating perimeter of shapes, encourage children to mark off the sides as they add them up to prevent repetition of counting/omission of sides.	
	Area of Rectangles	What properties of these shapes do you need to know to help you work this out? What can you tell me about the sides of a square/rectangle? How does this help you work out this question? Will the formula 'Area =length ×width' work for any shape, or only squares and rectangles?	Children build on previous knowledge in Year 4 by counting squares to find the area. They then move on to using a formula to find the area of rectangles. Is a square a rectangle? This would be a good discussion point when the children are finding different rectangles with a given area. For example, a rectangle with an area of 36 cm^2 could have four equal sides of 6 cm.	
	Area of Compound Shapes	What formula do we use to find the area of a rectangle? Can you see any rectangles within the compound shapes? How can we split the compound shape? Is there more than one way? Do we get a different answer if we split the	Children learn to calculate area of compound shapes. They need to be careful when splitting shapes up to make sure they know which lengths correspond to the whole shape, and which to the smaller shapes they have created. They will discover that the	

		shape differently	area remains the same no matter how you split up the shapes. Children need to have experience of drawing their own shapes in this step	
	Area of Irregular Shapes	How many whole squares can you see? How many part squares can you see? Can you find any part squares that you could be put together to make a full square? What will we do with the parts? What does approximate mean?	Children use their knowledge of counting squares to estimate the areas of shapes that are not rectilinear. They use their knowledge of fractions to estimate how much of a square is covered and combine different part-covered squares to give an overall approximate area. Children need to physically annotate to avoid repetition when counting the squares.	