Year 5&6 – Medium Term Planning

Alongside this document, ensure that the Calculation Policy is being used at all times:

Non-Negotiables:

- All lessons must include opportunities for children to develop **Fluency**, **Reasoning** and **Problem Solving** skills.
- All lessons must offer **Greater Depth** opportunities for higher achievers
- Children must be taught to understand Mathematical structures through the use of models and images
- Children should be guided in their reasoning through the use of **Stem Sentences** and explicit use of accurate mathematical language by the teacher and children.
- The Units below **MUST** be taught in this order – Please discuss with your Maths Leader if you wish to change this for any reason.

Assessments

- Daily recording in maths books inform instant interventions and adapt lessons to meet the needs of all learners
- Fluency Tests to be taken once every half term
- Previous SAT papers will be used from the Spring Term (Year 6) Autumn term
- Children take KS2 SAT papers in May (Year 6)
- Testbase Assessment to be taken at the end of the Summer term (Year 5)
- NFER Assessments taken in Autumn, Spring and Summer term (Year 5)

Other Points:

- Mental Oral Starters can be used to fulfil part of fluency but should also be used for a **fraction, decimal and percentage equivalence EVERY** week and an opportunity to **consolidate and revisit previous learning** from other units. Initially, these will be used to **apply skills learnt from previous years** until the subject areas are covered in Year 5
- Any weeks left at the end of each term should be used for **closing the gap** and giving children the opportunity to **apply** their learnt skills to a real life context through reasoning and problem solving activities
- Ensure we use concrete models and images to support understanding of all 4 operations.

Problem Solving and Reasoning Questions Support

- I See Reasoning for reasoning questions
- White Rose units stated above for Problem Solving and Reasoning questions
- NRICH use the curriculum maps to current teaching (https://nrich.maths.org/teacher-primary)
- White Rose/Diagnostic Questions - https://diagnosticquestions.com/whiterose   You will need to sign-up to this website.

Greater Depth Questions Support

- NCETM Mastery and Greater Depth – https://www.ncetm.org.uk/resources/46689
- Mastery with Greater Depth Textbook – See Maths section on Teams ☐   I See Reasoning

Models and Images Support and Ideas

- NCETM Spine Resources - https://www.ncetm.org.uk/resources/50640 - This can also be used to support **subject knowledge**

Year 5 / 6 - Autumn Term

Week 1	2	3	4	5	6	7	8	9	10	11	12
Place Value			Four Operations						Prime numbers	Statistics	

Place Value	Four Operations	Prime numbers	Statistics
Number: Place Value Read, write, order and compare numbers to at least 1000000 and determine the value of each digit. **Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit.** Count forwards or backwards in steps of powers of 10 for any given number up to 1000000. Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers including through zero. **Use negative numbers in context, and calculate intervals across zero.** Round any number up to 1000000 to the nearest 10, 100, 1000, 10000 and 100000. **Round any whole number to a required degree of accuracy.** Solve number problems and practical problems that involve all of the above. **Solve number and practical problems that involve all of the above.** Read Roman numerals to 1000 (M) and recognise years written in Roman numerals. Read, write, order and compare numbers with up to three decimal places. **Identify the value of each digit in numbers given to three decimal places and multiply numbers by 10, 100 and 1000 giving answers up to 3dp.** Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents. Round decimals with two decimal places to the nearest whole number and to one decimal place. Solve problems involving number up to 3dp. **Solve problems which require answers to be rounded to specified degrees of accuracy.** Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	**Number: Addition, Subtraction, Multiplication & Division** Add and subtract numbers mentally with increasingly large numbers. **Perform mental calculations, including with mixed operations and large numbers.** Add and subtract whole numbers with more than 4 digits, 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. **Use estimation to check answers to calculations and determine in the context of a problem, an appropriate degree of accuracy.** Solve addition and subtraction multi-step problems in contexts deciding which operations and methods to use and why. **Solve addition and subtraction multi step problems in contexts, deciding which operations and methods to use and why.** Multiply and divide numbers mentally drawing upon known facts. Multiply and divide whole numbers by 10, 100 and 1000. **Perform mental calculations, including with mixed operations and large numbers.** Multiply numbers up to 4 digits by a one or two digit number using a formal written method, including long multiplication for 2 digit numbers. **Multiply multi-digit number up to 4 digits by a 2 digit number using the formal written method of long multiplication.** Divide numbers up to 4 digits by a one digit number using the formal written method of short division and interpret remainders appropriately for the context. **Divide numbers up to 4 digits by a 2 digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions or by rounding as appropriate for the context.** **Divide numbers up to 4 digits by a 2 digit number using the formal written method of short division, interpreting remainders according to context.** Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. **Identify common factors, common multiples and prime 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. Solve problems involving addition and subtraction, multiplication and division and a combination of these, including understanding the use of the equals sign. **Solve problems involving addition, subtraction, multiplication and division.** **Use their knowledge of the order of operations to carry out calculations involving the four operations.**	**Number- Prime Numbers** Know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers. Establish whether a number up to 100 is prime and recall prime numbers up to 19	**Statistics** Solve comparison, sum and difference problems using information presented in a line graph. **Interpret and construct pie charts and line graphs and use these to solve problems** Complete, read and interpret information in tables including timetables. **Calculate the mean as an average.**
Possible Stem Sentences: "In the base 10 system, 10 of one column make 1 of the next column to the left." "10 tenths are equal to one. 10 hundredths equal one tenth. 100 hundredths equal one unit."	**Possible Stem Sentences:** "When adding/subtracting always start at the lowest place value column." "When exchanging 1 in a column is equal to 10 in the column to the right." "In addition, we can adjust the parts but the whole must stay the same." " When multiplying by one digit, when you have more than 10 exchange into the column to the left."		

Bold text refers to upper year group Year 5 / 6 - Spring Term

Week 1	2	3	4	5	6	7	8	9	10	11
Fractions				Decimals		Percentages		Algebra	Geometry – Angles and shape/ Position & Direction	

Number: Fractions

Compare and order fractions whose denominators are multiples of the same number. **Compare and order fractions, including fractions > 1**

Generate and describe linear number sequences (with fractions)

Identify, name and write equivalent fractions of a given fraction, represented visually including tenths and hundredths.

Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.

Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements >1 as a mixed number [for example + = = 1]

Add and subtract fractions with the same denominator and denominators that are multiples of the same number. **Add and subtract fractions with different denominations and mixed numbers, using the concept of equivalent fractions.**

Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. **Multiply simple pairs of proper fractions, writing the answer in its simplest form**

Divide proper fractions by whole numbers [for example ÷ 2 =]

Read and write decimal numbers as fractions [for example 0.71 =] **Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example]**

Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates. **Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples**

Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.

Number: Decimals Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.

Multiply one digit numbers with up to 2dp by whole numbers.

Use written division methods in cases where the answer has up to two decimal places.

Number: Percentages

Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal.

Solve problems which require knowing percentage and decimal equivalents of , , , , and those fractions with a denominator of a multiple of 10 or 25.

Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

Solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for

Ratio and proportion

I can solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.

I can solve problems involving the calculation of percentages, for example of measures and the use of percentages for comparison.

I can solve problems involving similar shapes where the scale factor is known or can be found.

I can solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

Number: Algebra

Use simple formulae. Generate and describe linear number sequences. Express missing number problems algebraically Find pairs of numbers that satisfy an equation with two unknowns. Enumerate possibilities of a combination of two variables.

Year 5- Recap FDP

Geometry - Angles & Properties of Shape

Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles.

Draw given angles, and measure them in degrees **Draw 2D shapes using given dimensions and angles.**

Identify: angles at a point and one whole turn (total 360o), angles at a point on a straight line and ½ a turn (total 180o) other multiples of 90o **Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.**

Identify 3D shapes, including cubes and other cuboids, from 2D representations.

Use the properties of rectangles to deduce related facts and find missing lengths and angles.

Distinguish between regular and irregular polygons based on reasoning about equal sides and angles. **Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals and regular polygons.**

Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius

Solve problems involving similar shapes where the scale factor is known or can be found. Geometry-position and direction

Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed. **Describe positions on the full coordinate grid (all four quadrants). Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.**

Possible Stem Sentences:

A fraction is an equal part of a whole and the whole can be anything "¾ is 3 of 4 equal parts "
"The greater the denominator, the smaller the fraction when the numerator stays the same."
"The greater the numerator, the bigger the fraction when the denominator stays the same."
"A unit fraction is where the denominator is 1"
A factor of a number is a number that is the same or less than that number that divides into it equally.
A multiple of a number is a number that we get from multiplying the number by an integer, which can be the original number if multiplied by 1.
Ratio is a way of comparing two or more quantities.

Possible Stem Sentences:

Translation of a shape is when you move the shape without changing the orientation (rotate) or size.

Year 5 / 6 - Summer Term

Week 1	2	3	4	5	6	7	8	9	10	11	12
Converting Units	Area & Perimeter	Volume	SATS (Yr6) Measures (Yr)			**Investigations (3 weeks)**			**Transition to KS3 (3 weeks)**		

Converting Units	Area & Perimeter	Volume	SATS / Measures	Investigations / Transition to KS3
Converting units: Convert between different units of metric measure (, km and m; cm and m; cm and mm; g and kg; l and ml) **Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation up to 3dp.** Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints. **Convert between miles and kilometres.** Solve problems involving converting between units of time **Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.**	**Area and Perimeter** Measure and calculate the perimeter of composite rectilinear shapes in cm and m. **Calculate the area of parallelograms and triangles.** Calculate and compare the area of rectangles (including squares), and including using standard units, cm2,m2 estimate the area of irregular shapes. **Recognise that shapes with the same areas can have different perimeters and vice versa.** **Possible Stem Sentences:** Variable is a quantity that may change within the context of a mathematical problem. Perimeter is the total distance around the outside Area is the total interior space of a shape and is expressed in units squared.	**Volume** Estimate volume [for example using 1cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water] **Calculate, estimate and compare volume of cubes and cuboids using standard units, including cm3, m3 and extending to other units (mm3, km3)** Use all four operations to solve problems involving measure **Recognise when it is possible to use formulae for area and volume of shapes.**	**Measures** es Revisit and consolidate Y5 measure objective **Y6 SATS**	**Investigations** solve problems involving addition, subtraction, multiplication and division use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy solve problems which require answers to be rounded to specified degrees of accuracy solve problems involving the relative sizes of 2 quantities where missing values can be found by using integer multiplication and division facts solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison solve problems involving similar shapes where the scale factor is known or can be found solve problems involving unequal sharing and grouping using knowledge of fractions and multiples solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate **Revisit & consolidate** Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit Use negative numbers in context, and calculate intervals across 0 Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts Find pairs of numbers that satisfy an equation with 2 unknowns Enumerate possibilities of combinations of 2 variables Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

Top Tips Ensure all revision follows a sequence of; recapping key conceptual ideas, procedural calculations and then reasoning and problem solving. It is key that fluency is continually practised.