Maths Curriculum Overview: **Lesson Design** Year 5 – **2019 - 2020**

At Woodhouse Primary School we encourage our pupils to be confident, resilient mathematicians with a love of learning and no fear of 'grappling' with difficult concepts and those expressed in an unfamiliar way.
In our school, children are scaffolded, extended and supported through rapid teacher intervention, use of equipment and choice of strategies e.g. jottings/mental/resources. As such teaching is both enabling and extending.

Term :	**Lesson Design : Curriculum objectives**	Any adjustments/comments
Autumn 1	**Number: Place Value** • 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, 1000, 10,000 and 100,000 • solve number problems and practical problems that involve all of the above **Number: Addition and Subtraction** • add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • add and subtract numbers mentally with increasingly large numbers • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. **Geometry : Properties of Shapes** • identify 3-D shapes, including cubes and other cuboids, from 2-D representations	Completing throughout Spring term along with other concepts
Autumn 2	**Number: Place Value** • count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 • round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 and 100,000 **Number: Addition and Subtraction** • add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • add and subtract numbers mentally with increasingly large numbers • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	

Number: Multiplication and Division

- identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
- know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
- establish whether a number up to 100 is prime and recall prime numbers up to 19
- multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
- multiply and divide numbers mentally drawing upon known facts
- 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
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- 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, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Measurement: Length and Height/Mass and Weight/ Capacity and Volume

- convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)
- use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.

Geometry: Properties of Shapes

- know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
- draw given angles, and measure them in degrees (o)
- identify:
- angles at a point and one whole turn (total 360o)
- angles at a point on a straight line and 21 a turn (total 180°)
- other multiples of 90°
- 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.

Completing throughout Spring term along with other concepts

	Number: Place Value • read Roman numerals to 1000 (M) and recognise years written in Roman numerals. **Number:Fractions (including decimals and percentages)** • compare and order fractions whose denominators are all multiples of the same number • identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths • 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] 5 2 5 4 5 6 5 1	
Spring 1	**Number: Place Value** • count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 • round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 and 100,000 **Number: Addition and Subtraction** • add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • add and subtract numbers mentally with increasingly large numbers • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy **Number: Multiplication and Division** • identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers • multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers • multiply and divide numbers mentally drawing upon known facts • 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 • multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign **Number: Fractions (including decimals and percentages)** • compare and order fractions whose denominators are all multiples of the same number	

	• identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths • 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] 5 2 5 4 5 6 5 1 • add and subtract fractions with the same denominator and denominators that are multiples of the same number • multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams • read and write decimal numbers as fractions [for example, 0.71 = 71 hundredths • 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 • read, write, order and compare numbers with up to three decimal places • solve problems involving number up to three decimal places • 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 and those fractions with a denominator of a multiple of 10 or 25.	
Spring 2	**Number: Place Value** • count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 • round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 and 100,000 **Number: Addition and Subtraction** • add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • add and subtract numbers mentally with increasingly large numbers • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy **Number: Multiplication and Division** • identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers • multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers • multiply and divide numbers mentally drawing upon known facts • 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 • multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	

	• solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign **Measurement: Length and Height/Mass and Weight/ Capacity and Volume** • convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) **Geometry: Properties of Shapes** • know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • draw given angles, and measure them in degrees (o) • identify: angles at a point and one whole turn (total 360o) angles at a point on a straight line and 21 a turn (total 180o) other multiples of 90° • 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. **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. **Measurement: Perimeter and Area** • measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes.	Completing throughout Spring term along with other concepts
Summer 1	**Number: Place Value** • count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 • round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 and 100,000 **Number: Addition and Subtraction** • add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • add and subtract numbers mentally with increasingly large numbers • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	

	Number: Multiplication and Division • identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers • multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers • multiply and divide numbers mentally drawing upon known facts • 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 • multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign **Number: Fractions (including decimals and percentages)** • *round decimals with two decimal places to the nearest whole number and to one decimal place* • *read, write, order and compare numbers with up to three decimal places* **Measurement: Volume** • estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water] **Measurement: Time** • solve problems involving converting between units of time • use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling. **Statistics** • complete, read and interpret information in tables, including timetables. • solve comparison, sum and difference problems using information presented in a line graph.	Completing throughout Spring and Summer terms along with other concepts
Summer 2	**Number: Place Value** • count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 • round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 and 100,000 **Number: Addition and Subtraction** • add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	

- add and subtract numbers mentally with increasingly large numbers
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy

Number: Multiplication and Division

- identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
- know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
- multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
- multiply and divide numbers mentally drawing upon known facts
- 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
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign

Number: Fractions (including decimals and percentages)

- round decimals with two decimal places to the nearest whole number and to one decimal place
- read, write, order and compare numbers with up to three decimal places

Geometry : Properties of Shapes

- identify 3-D shapes, including cubes and other cuboids, from 2-D representations
- understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints

Statistics

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

Measurement: Volume

- estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water]

Measurement: Time

- solve problems involving converting between units of time
- use all four operations to solve problems involving measure [for example, length, mass, volume,

	money] using decimal notation, including scaling. • Understand the approximate equivalences between metric units and common imperial units such as inches, pounds and pints	
	We aim that all pupils: • Become **fluent in the fundamentals** of mathematics so that they develop the **conceptual** as well as **procedural** understanding that underpins a concept and the ability to recall and apply knowledge rapidly and accurately. • Can **reason mathematically** by following a line of enquiry and develop and present a justification, argument or proof using mathematical language. • Can **solve problems** by applying their mathematics to a variety of problems with increasing sophistication, including unfamiliar contexts and real-life scenarios. • Can use the **language of mathematics** accurately discussing their learning with confidence and precision. **In mathematics lessons you will see:** • Teachers and children having fun and demonstrating positive 'can do' attitudes. • High expectations of learning where ALL children are challenged and 'grappling' with concepts; they will demonstrate resilience and independence. • Insistence on mathematical terminology being used accurately and confidently to explain learning and understanding • Children confidently using resources from around the classroom to support their learning. • Well-designed lessons to build upon previous learning to help learners to remember in the long term. **e.g.** repetition of stem sentences for 'sticky knowledge'; small steps; layered learning to enable and extend • Timely and rapid interventions to address misconceptions. • Effective questioning where teachers adapt learning within the lesson to support the progress of all learners. • Application of skills to non-standard situations including the use of non-examples to challenge thinking.	
	Helpful Resources: **<u>Maths Generic : Curriculum 2019</u>** ❖ **Bespoke Woodhouse Progression Documents :** Number Fluency; Shape Dictionary; Measurement Charts	

	❖ **White Rose Maths Documents :** Small Steps ; Maths Glossary; Maths Questions ❖ **Mastery:** Staff Training; WR Mastery Documents; Quigley Mastery Examples ❖ **Quigley Milestones:** B A D examples	