|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Happiness Responsibility Friendship Respect Courage** | | | | |
| **Maths – Year 5** | | | | |
|  | **Starter focus (Flashback 4 from WhiteRose materials)** | **Planning and teaching sequence (see WhiteRose materials)** | **Arithmetic Weekly Assessment (10 questions)** | **National Curriculum End of Year expectation** |
| **Place Value -** 14 lessons | **Flashback 4** – daily  **Mental strategies** (2 starters):  Adding and subtracting multiples of 1000 and 100 with equals placement.  **Revisit**:  Written method addition.  Area (Y4) | Roman numerals to 1,000 | Multiply by zero/Divide by 1/Using Times Tables including partitioning/  Partitioning/Adding and subtracting using place value knowledge. | Read, write and 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.  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 the above.  Read Roman numerals to 1000 (M) and recognise years written in Roman numerals. |
| Numbers to 10,000 |
| Numbers to 100,000 |
| Numbers to 1,000,000 |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Adding fractions to mixed numbers.  Addition of fractions to equal one whole.  **Revisit**:  Written method subtraction.  Multiply and divide by 10 and 100 | Read and write numbers to 1,000,000. | Using Times Tables including partitioning/Partitioning/Adding and subtracting using place value knowledge/ Adding and subtracting multiples of 1000 and 100 with equals placement/Adding and subtracting fractions with the same denominator. |
| Powers of 10 |
| Mental strategies :10/100/1,000/10,000/100,000 more or less |
| Partition numbers to 1,000,000 |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Subtraction of fractions from the whole (with images)  Subtraction of fractions from mixed numbers (with images)  **Revisit**:  Written method multiplication.  Multiply 3 numbers (Y4) | Number line to 1,000,000 | Adding and subtracting using place value knowledge/ Adding and subtracting multiples of 1000 and 100 with equals placement/Adding and subtracting fractions with the same denominator/ Adding fractions to mixed numbers / Addition of fractions to equal one whole. |
| Compare and order numbers to 100,000. |
| Compare and order numbers to 1,000,000. |
| Round to the nearest 10, 100 or 1,000 |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Fractions of quantities (2 days) | Round within 100,000 | Mental partitioning (Y5) / Subtraction of fractions from the whole/ Subtraction of fractions from mixed numbers /Adding fractions to mixed numbers / Addition of fractions to equal one whole. |
| Round within 1,000,000 |
|  | | | | |
| **Addition and Subtraction -** 14 lessons | **Revisit**:  Written method division.  Perimeter (Y4) | Mental strategies 1: Adding and subtracting powers of 10 |  | 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. |
| Mental strategies 2: Using adjustment to add. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Balance equations (2 sessions to include +, - and x)  **Revisit**:  Written method subtraction.  Converting improper fractions to mixed numbers (with images) | Mental strategies 3: Using adjustment to subtract. | Mental partitioning (Y5) / Subtraction of fractions from the whole/ Subtraction of fractions from mixed numbers /Adding fractions to mixed numbers / Fractions of quantities |
| Mental strategies 4: Using partitioning to add and subtract. |
| Add whole numbers with more than four digits. |
| Subtract whole numbers with more than four digits. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Adjustment for subtraction and addition (2 sessions)  **Revisit**:  Written method multiplication.  Converting mixed numbers to improper fractions (with images) | Round to check answers | Balance equations / Subtraction of fractions from the whole/ Subtraction of fractions from mixed numbers /Adding fractions to mixed numbers / Fractions of quantities |
| Inverse operations (addition and subtraction) |
| Addition and subtraction problems 1: Identifying addition or subtraction operation |
| Addition and subtraction problems 2: Identifying calculation method as mental or written. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Mental strategies :10/100/1,000/10,000/100,000 more or less  **Revisit**:  Written method division.  Writing tenths and hundredths as fractions/decimals | Addition and subtraction problems 3: Multistep problems. | Balance equations / Subtraction of fractions from the whole/ Adjustment for addition and subtraction/Adding fractions to mixed numbers / Fractions of quantities |
| Compare calculations |
| Find missing numbers 1: Mental strategies - place value and adjustment. |
| Find missing numbers 2: Mental strategies -adjusting multiples of 1000. |
|  | | | | |
| **Multiplication and Division A**  **10 lessons** | **Flashback 4** – daily  **Mental strategies** (2 starters):  Adding and subtracting powers of 10  Using adjustment to add.  **Revisit**:  Written method subtraction  Division of decimals by 10 and 100 | Multiples | Balance equations / Mental strategies :10/100/1,000/10,000/100,000 more or less  / Adjustment for addition and subtraction / Multiply 3 numbers / Fractions of quantities | 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 (nonprime) numbers. Establish whether a number up to 100 is prime and recall prime numbers up to 19.  Multiply and divide numbers mentally drawing upon known facts. 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). |
| Common multiples |
| Factors |
| Common factors |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Using adjustment to subtract  Using partitioning to add and subtract  **Revisit**:  Written method multiplication  Multiplication of decimals by 10 or 100 | Prime numbers | Adding and subtracting powers of 10 / Using adjustment to add / Multiply by zero / Divide by 1 / Fractions of quantities |
| Square numbers |
| Cube numbers |
| Mental strategies 1: Multiply by 10, 100 and 1,000 |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Place value and adjustment.  Adjusting multiples of 1000.  **Revisit**:  Written method division  Round decimals to the nearest whole number | Mental strategies 2: Divide by 10, 100 and 1,000 | Adding and subtracting powers of 10 / Using adjustment to add / Multiply by zero / Divide by 1 / Fractions of quantities / Using partitioning to add and subtract |
| Mental strategies 3: Multiples of 10, 100 and 1,000 |
|  | | | | |
| **Fractions A -** 16 lessons |  | Find fractions equivalent to a unit fraction. |  | 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, 2/5 + 4/5 = 6/5= 1 1/5].  Add and subtract fractions with the same denominator and denominators that are multiples of the same number. |
| Find fractions equivalent to a non-unit fraction. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Multiply by 10, 100, 1000  Divide by 10, 100, 1000  **Revisit**:  Written method subtraction  Decimal halves, quarters and three quarters | Recognise equivalent fractions. | Using adjustment to add / Multiply by zero / Divide by 1 / Fractions of quantities / Using partitioning to add and subtract / Adjusting multiples of 1000 |
| Convert improper fractions to mixed numbers. |
| Convert mixed numbers to improper fractions. |
| Compare fractions less than 1. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Mental partitioning  Multiply by zero  **Revisit**:  Written method multiplication  Coordinates and translation | Order fractions less than 1. | Using adjustment to add / Multiply by zero / Divide by 1 / Fractions of quantities / Using partitioning to add and subtract / Adjusting multiples of 1000 / Multiply by 10, 100, 1000 / Divide by 10, 100, 1000 |
| Compare and order fractions greater than 1. |
| Add and subtract fractions with the same denominator. |
| Add fractions within 1. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Subtraction of fractions from the whole (mental) – 2 sessions  **Revisit**:  Written method division  Roman numerals to 1000 | Add fractions with total greater than 1. | Adding and subtracting fractions with the same denominator / Using adjustment to add / Fractions of quantities / Using partitioning to add and subtract / Adjusting multiples of 1000 / Multiply by 10, 100, 1000 / Divide by 10, 100, 1000 |
| Add to a mixed number. |
| Add two mixed numbers. |
| Subtract fractions. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Divide by 1  Missing numbers addition  **Revisit**:  Written method subtraction  Compare and order numbers to 100,000 | Subtract from a mixed number. | Adding and subtracting fractions with the same denominator / Subtraction of fractions from the whole / Fractions of quantities / Using partitioning to add and subtract / Adjusting multiples of 1000 / Multiply by 10, 100, 1000 / Divide by 10, 100, 1000 |
| Subtract from a mixed number – breaking the whole. |
|  | | | | |
| **Multiplication and Division B -** 11 lessons |  | Multiply a 2-digit number by a 2-digit number. |  | 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.  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. |
| Multiply a 2-digit number by a 2-digit number - consolidate |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Missing numbers addition  Fractions of amounts  **Revisit**:  Written method multiplication 2 x 2  Round to the nearest 10,100,1000 | Multiply a 3-digit number by a 2-digit number. | Adding and subtracting fractions with the same denominator / Subtraction of fractions from the whole / Fractions of quantities / Using partitioning to add and subtract / Adjusting multiples of 1000 / Multiply by 10, 100, 1000 / Divide by 10, 100, 1000 / Missing numbers addition |
| Multiply a 3-digit number by a 2-digit number - consolidate |
| Multiply a 4-digit number by a 2-digit number. |
| Multiply a 4-digit number by a 2-digit number - consolidate |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Add two mixed numbers  Subtract fractions with different denominators  **Revisit**:  Written method multiplication 3 x 2  Common multiples | Solve problems with multiplication. | Adding and subtracting fractions with the same denominator / Subtraction of fractions from the whole / Fractions of quantities / Using partitioning to add and subtract / Adjusting multiples of 1000 / Multiply by 10, 100, 1000 / Divide by 10, 100, 1000 / Missing numbers addition |
| Short division. |
| Divide a 4-digit number by a 1-digit number. |
| Divide with remainders. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Fractions of amounts  Multiply a non-unit fraction by an integer  **Revisit**:  Written method multiplication 4 x 2  Common factors | Mental strategies: Efficient division using known facts and place value knowledge. | Subtraction of fractions from the whole / Fractions of quantities / Using partitioning to add and subtract / Adjusting multiples of 1000 / Multiply by 10, 100, 1000 / Divide by 10, 100, 1000 / Missing numbers addition / Add two mixed numbers / Subtract fractions with different denominators |
| Mental strategies: Efficient division using flexible partitioning. |
| Solve problems with multiplication and division. |
|  | | | | |
| **Fractions B -** 7 lessons | **Flashback 4** – daily  **Mental strategies** (2 starters):  Efficient division using known facts and place value knowledge (2 starters)  **Revisit**:  Written method division  Prime numbers | Multiply a unit fraction by an integer. | Subtraction of fractions from the whole / Fractions of quantities / Using partitioning to add and subtract / Multiply a non-unit fraction by an integer  / Multiply by 10, 100, 1000 / Divide by 10, 100, 1000 / Missing numbers addition / Add two mixed numbers / Subtract fractions with different denominators | Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. |
| Multiply a non-unit fraction by an integer. |
| Multiply a mixed number by an integer. |
| Calculate a fraction of a quantity. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Efficient division using flexible partitioning (2 starters)  **Revisit**:  Written method subtraction  Cube numbers | Fraction of an amount. | Subtraction of fractions from the whole / Fractions of quantities / Using partitioning to add and subtract / Multiply a non-unit fraction by an integer  / Multiply by 10, 100, 1000 / Divide by 10, 100, 1000 / Efficient division using known facts and place value knowledge / Add two mixed numbers / Subtract fractions with different denominators |
| Find the whole. |
| Use fractions as operators. |
|  | | | | |
| **Decimals and percentages -**15 lessons | **Flashback 4** – daily  **Mental strategies** (2 starters):  Missing numbers addition  Fractions of amounts  **Revisit**:  Written method multiplication  Calculating equivalent fractions | Decimals up to 2 decimal places. | Subtraction of fractions from the whole / Fractions of quantities / Using partitioning to add and subtract / Multiply a non-unit fraction by an integer  / Multiply by 10, 100, 1000 / Divide by 10, 100, 1000 / Efficient division using known facts and place value knowledge / Add two mixed numbers / Efficient division using flexible partitioning / Subtract fractions with different denominators | Read and write decimal numbers as fractions [for example, 0.71 = 71/100].  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 of 1/2 , 1/4 , 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25. |
| Equivalent fractions and decimals (tenths). |
| Equivalent fractions and decimals (hundredths). |
| Equivalent fractions and decimals. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Add fractions with different denominators  Add two mixed numbers  **Revisit**:  Written method division  Converting improper fractions to mixed numbers | Thousandths as fractions. | Subtraction of fractions from the whole / Fractions of quantities / Using partitioning to add and subtract / Multiply a non-unit fraction by an integer  / Multiply by 10, 100, 1000 / Divide by 10, 100, 1000 / Efficient division using known facts and place value knowledge / Add two mixed numbers / Efficient division using flexible partitioning / Subtract fractions with different denominators |
| Thousandths as decimals. |
| Thousandths on a place value chart. |
| Order and compare decimals (same number of decimal places). |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Add to a mixed number  Subtract fractions with different denominators  **Revisit**:  Written method subtraction  Converting mixed numbers to improper fractions | Order and compare any decimals with up to 3 decimal places. | As above using teacher assessment for focus. |
| Round to the nearest whole number. |
| Round to 1 decimal place. |
| Understand percentages. | As above using teacher assessment for focus. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Subtract fractions with different denominators  Subtract from a mixed number  **Revisit**:  Written method multiplication  Add fractions with total greater than 1. | Percentages as fractions. | As above using teacher assessment for focus. |
| Percentages as decimals. |
| Equivalent fractions, decimals and percentages. |
|  | | | | |
| **Perimeter and Area -** 6 lessons | **Flashback 4** – daily  **Mental strategies** (2 starters):  Subtracting a decimal from a whole number (2 sessions)  **Revisit**:  Written method division  Multiplying fractions by an integer | Perimeter of rectangles. | As above using teacher assessment for focus. | 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 (cm2 ) and square metres (m2 ) and estimate the area of irregular shapes. |
| Perimeter of rectilinear shapes. |
| Perimeter of polygons. |
| Area of rectangles. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Fractions of amounts  Add fractions with different denominators  **Revisit**:  Written method subtraction  Multiplying mixed numbers by an integer | Area of compound shapes. | As above using teacher assessment for focus. |
| Estimate area. |
|  | | | | |
| **Statistics -** 5 lessons |  | Draw line graphs. |  | Solve comparison, sum and difference problems using information presented in a line graph.  Complete, read and interpret information in tables, including timetables. |
| Read and interpret line graphs. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Add to a mixed number  Add two mixed numbers  **Revisit**:  Written method multiplication  Fractions – finding the whole | Read and interpret tables. | As above using teacher assessment for focus. |
| Two-way tables. |
| Read and interpret timetables. |
|  | | | | |
| **Geometry – Shape -** 10 lessons |  | Understand and use degrees. |  | Identify 3-D shapes, including cubes and other cuboids, from 2-D representations.  Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles.  Draw given angles and measure them in degrees.  Identify angles at a point and one whole turn, angles at a point on a straight line and 1/2 a turn as well as 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. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Subtract fractions with different denominators  Subtract from a mixed number  **Revisit**:  Written method division  Fractions as operators | Classify Angles. | As above using teacher assessment for focus. |
| Estimate angles. |
| Measure angles up to 180 degrees. |
| Draw lines and angles accurately. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Multiply a non-unit fraction by an integer  Balanced equations  **Revisit**:  Written method subtraction  Rounding to the nearest 1dp | Calculate angles around a point. | As above using teacher assessment for focus. |
| Calculate angles on a straight line. |
| Lengths and angles in shapes. |
| Regular and irregular polygons. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Add fractions with different denominators  Subtract from a mixed number  **Revisit**:  Written method multiplication | 3D shapes. | As above using teacher assessment for focus. |
|  | | | | |
| **Geometry – Position and direction -** 6 lessons |  | Read and plot coordinates. |  | 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. |
| Problem solving with coordinates. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Add to a mixed number  Subtract fractions with different denominators  **Revisit**:  Written method division  Equivalent fractions, decimals and percentages | Translation. | As above using teacher assessment for focus. |
| Translation with coordinates. |
| Lines of symmetry. |
| Reflection in horizontal and vertical lines. |
|  | | | | |
| **Decimals -** 12 lessons | **Flashback 4** – daily  **Mental strategies** (2 starters):  Add two mixed numbers  Multiply a non-unit fraction by an integer  **Revisit**:  Written method subtraction  Equivalent fractions, decimals and percentages | Use known facts to add and subtract decimals within 1. | As above using teacher assessment for focus. | Solve problems involving number up to three decimal places.  Solve problems which require knowing percentage and decimal equivalents of 1/2, 1/4, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25.  Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. |
| Compliments to 1. |
| Add and subtract decimals across 1. |
| Add decimals with the same number of decimal places. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Fractions of amounts  Subtract from a mixed number  **Revisit**:  Written method multiplication  Perimeter | Subtract decimals with the same number of decimal places. | As above using teacher assessment for focus. |
| Add decimals with a different number of decimal places. |
| Subtract decimals with a different number of decimal places. |
| Efficient strategies for adding and subtracting decimals. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Multiply a non-unit fraction by an integer  Balanced equations  **Revisit**:  Written method division  Area | Decimal sequences. | As above using teacher assessment for focus. |
| Multiply by 10, 100 and 1000. |
| Divide by 10, 100 and 1000. |
| Multiply and divide decimals – missing values. |
|  | | | | |
| **Negative numbers -** 5 lessons | **Flashback 4** – daily  **Mental strategies** (2 starters):  Multiply by 10, 100, 1000  Divide by 10, 100, 1000  **Revisit**:  Written method subtraction  Angles around a point | Understand negative numbers. | As above using teacher assessment for focus. | Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero. |
| Count through zero in 1s. |
| Count through zero in multiples. |
| Compare and order negative numbers. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Add decimals with a different number of decimal places.  Subtract decimals with a different number of decimal places  **Revisit**:  Written method multiplication  Angles on a straight line | Find the difference. | As above using teacher assessment for focus. |
|  | | | | |
| **Measures – Converting Units -**6 lessons |  | Kilograms and kilometres. |  | Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre).  Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints.  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. |
| Millimetres and millilitres. |
| Convert units of length. |
| **Flashback 4** – daily  **Mental strategies** (2 starters):  Add fractions with different denominators  Add to a mixed number  **Revisit**:  Written method division  Translation and coordinates | Convert between metric and imperial units. | As above using teacher assessment for focus. |
| Convert units of time. |
| Calculate with timetables. |
|  | | | | |
| **Measures – Volume -** 4 lessons | **Flashback 4** – daily  **Mental strategies** (2 starters):  Add two mixed numbers  Subtract from a mixed number  **Revisit**:  Written method subtraction  Compliments to 1 | Cubic centimetres. | As above using teacher assessment for focus. | Estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water].  Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling. |
| Compare volume. |
| Estimate volume. |
| Estimate capacity. |