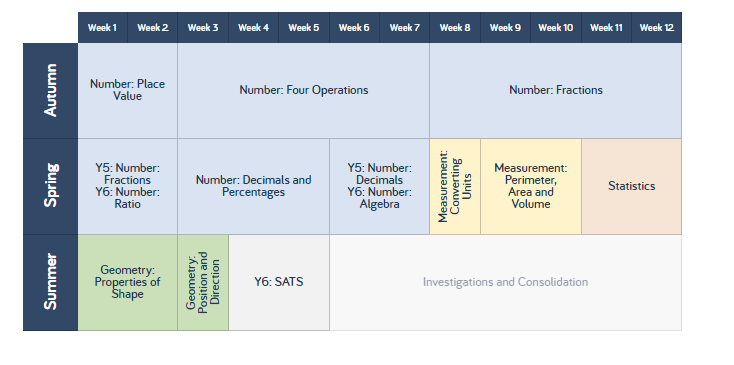
**Cambois Primary School** **Long Term Plan Year 5/6**



**Place Value**

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| Link to WRMH small steps | * <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/SoLs/Primary/MixedAge/Year-5-and-6-Mixed-Age-Autumn-Block-1-Place-Value-1.pdf> | | |
| Key NC outcomes | * read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit * read Roman numerals to 1000 (M) and recognise years written in Roman numerals * interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero * 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 * recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³) * identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places * 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 zero * identify common factors, common multiples and prime numbers * solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes   DFE GUIDANCE   * <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897804/Maths_guidance_year_5.pdf> * <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897805/Maths_guidance_year_6.pdf> | | |
| Mathematical language | Multiple  (Common) factor  Divisible  Factor pairs  Prime number, Composite number  Square number, Cube number  Power | Place value  Digit  Roman numerals  Negative number |  |
| Useful resources - reasoning | NRICH: [Factors and multiples KS2](http://nrich.maths.org/8960)  NRICH: [Two primes make one square](http://nrich.maths.org/1150)  NRICH: [Up and down staircases](http://nrich.maths.org/2283)  NRICH: [Sea level](http://nrich.maths.org/5929)  NRICH: [Tug Harder!](http://nrich.maths.org/public/viewer.php?obj_id=5898) | NCETM: [Place Value Reasoning](https://www.ncetm.org.uk/public/files/18416215/1_Progression_Map_Place_Value_Reasoning.pdf)  (questions in blue)  [NCETM mastery Y5](https://www.ncetm.org.uk/public/files/23305632/Mastery_Assessment_Y5_Low_Res.pdf)  [NCETM mastery y6](file:///C:\Users\USER\Downloads\Mastery_Assessment_Y6_Low_Res.pdf) | I can see reasoning documents in shared area |
| Possible misconceptions | * Many pupils believe that 1 is a prime number – a misconception which can arise if the definition is taken as ‘a number which is divisible by itself and 1’. * Some pupils may think that 91 is a prime number as it follows a pattern 11, 31, 41, 61, 71, etc. * A common misconception is to believe that 62 = 6 × 2 = 12 * Some pupils think the fifth place value is ‘millions’ - eg 24 567 is two million, four thousand, five hundred and sixty seven. * Some pupils can confuse the language of large (and small) numbers since the prefix ‘milli- means ‘one thousandth’ (meaning that there are 1000 millimetres in a metre for example) while one million is actually a thousand thousand. * The use of IIII on a clock face suggests that a Roman numeral can be repeated four times, but this is a special case. In general, three is the maximum number of repeats and the subtractive method should be used instead (i.e. IV) | | |
| Assessment | <https://wrm-13b48.kxcdn.com/wp-content/uploads/2018/08/Year-5-Place-Value_End-of-Block-Assessment.pdf>  <https://wrm-13b48.kxcdn.com/wp-content/uploads/2018/09/Year-6-Place-Value_End-of-Block-Assessment.pdf> | | |

**Four operations**

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| Link to WRMH small steps | * <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/SoLs/Primary/MixedAge/Year-5-and-6-Mixed-Age-Autumn-Block-2-Four-operations.pdf> | | |
| Key NC outcomes | * add and subtract numbers mentally with increasingly large numbers * add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) * solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and whymultiply and divide numbers mentally drawing upon known facts * multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 * 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 * 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   **Y6**   * divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division; interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context * divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context * use written division methods in cases where the answer has up to two decimal places * solve problems involving division * perform mental calculations, including with mixed operations and large numbers * solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why * multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication * solve problems involving addition, subtraction and multiplication * use their knowledge of the order of operations to carry out calculations | | |
| Mathematical language | Addition  Subtraction  Sum, Total  Difference, Minus, Less  Column addition  Column subtraction  Exchange  Operation  Estimate | Multiply, Multiplication, Times, Product  Commutative  Divide, Division, Divisible  Divisor, Dividend, Quotient, Remainder  Factor  Short multiplication, Long multiplication  Short division  Operation  Estimate |  |
| Useful resources - reasoning | NRICH: [Journeys in Numberland](http://nrich.maths.org/7285)  NRICH: [Twenty Divided Into Six](http://nrich.maths.org/public/viewer.php?obj_id=1047)  NRICH: [Two and Two](http://nrich.maths.org/public/viewer.php?obj_id=781)  NRICH: [Become Maths detectives](http://nrich.maths.org/6928)  NRICH: [Exploring number patterns you make](http://nrich.maths.org/8387)  NRICH: [Reach 100](http://nrich.maths.org/public/viewer.php?obj_id=1130) | NRICH: [Curious Number](http://nrich.maths.org/7218)  NRICH: [Make 100](http://nrich.maths.org/public/viewer.php?obj_id=1013)  NRICH [Dicey Operations](http://nrich.maths.org/6606). Games 4 and 5.  NRICH: [Factor-multiple chains](http://nrich.maths.org/public/viewer.php?obj_id=5578)  NRICH: [The Moons of Vuvv](http://nrich.maths.org/public/viewer.php?obj_id=1066)  NRICH: [Round and round the circle](http://nrich.maths.org/public/viewer.php?obj_id=86)  NRICH: [Counting cogs](http://nrich.maths.org/6966) | I can see reasoning (see shared area)  [NCETM mastery Y5](https://www.ncetm.org.uk/public/files/23305632/Mastery_Assessment_Y5_Low_Res.pdf)  [NCETM mastery y6](file:///C:\Users\USER\Downloads\Mastery_Assessment_Y6_Low_Res.pdf) |
| Possible misconceptions | * When subtracting mentally some pupils may deal with columns separately and not combine correctly; e.g. 180 – 24: 180 – 20 = 160. Taking away 4 will leave 6. So the answer is 166. * Some pupils incorrectly assume and use commutativity within column subtraction; for example:  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  | 7 | 4 | 1 | 2 | 6 | | – | 2 | 3 | 7 | 3 | 4 | |  | 5 | 1 | 6 | 1 | 2 |  * Some pupils may not use place value settings correctly (especially when the numbers have a different number of digits) * Some pupils may write statements such as 2 ÷ 8 = 4 * Some pupils may forget to ‘*put the zero down’* when multiplying the tens digit using long multiplication. * When using short division many pupils will at first struggle to deal correctly with any division where the divisor is greater than the first digit of the dividend; for example:  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | 0 | 10 | 7 | r 5 | | 8 | 3 | 86 | 61 |  |  * 3 ÷ 8 = 0 remainder 3, and so the 3 should be moved across. Instead, the 8 has been ‘moved across’ and therefore everything that follows has been correctly carried out based on an early misunderstanding. * Some pupils may write statements such as 140 - 190 = 50 * When subtracting mentally some pupils may deal with columns separately and not combine correctly; e.g. 180 – 24: 180 – 20 = 160. Taking away 4 will leave 6. So the answer is 166. * The use of BIDMAS (or BODMAS) can imply that division takes priority over multiplication, and that addition takes priority over subtraction. This can result in incorrect calculations. * Some pupils confuse factors and multiples. * Some pupils can confuse the language of large (and small) numbers since the prefix ‘milli- means ‘one thousandth’ (meaning that there are 1000 millimetres in a metre for example) while one million is actually a thousand thousand. * Some pupils may not realise that degrees (°) and degrees Celsius (°C) are two different and distinct units of measurement * Some pupils may think that 1 is a prime number | | |
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| Assessment | <https://wrm-13b48.kxcdn.com/wp-content/uploads/2018/10/Year-6-Four-Operations-A_v2.pdf>  Will need to combine for y5  <https://wrm-13b48.kxcdn.com/wp-content/uploads/2018/10/Year-5-Addition-and-Subtraction_v2.pdf>  <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/Year-5-Multiplication-and-Division.pdf> | | |

**Fractions**

**Decimals and Percentages**

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| Link to WRMH small steps | * <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/10/Year-5-and-6-Mixed-Age-Spring-Block-2-Decimals-and-Percentages.pdf> | | |
| Key NC outcomes | * recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents * read and write decimal numbers as fractions [for example, 0.71 = 71/100] * read, write, order and compare numbers with 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 involving number up to three decimal places * recall and use equivalences between simple fractions, decimals and percentages, including in different contexts | | |
| Mathematical language | Tenth, hundredth, thousandth  Per cent, Percentage  Decimal  Equivalent  Proportion |  |  |
| Useful resources - reasoning | NCETM: [Fractions Reasoning](https://www.ncetm.org.uk/public/files/18416412/4_Progression_Map_Fractions_Reasoning_.pdf) (questions in blue) | NRICH: [Spiralling decimals](http://nrich.maths.org/10326)  NCETM: [Activity D - Metre sticks and metre strips](https://www.ncetm.org.uk/resources/42655)  NCETM: [Activity F - Using blank hundred squares](https://www.ncetm.org.uk/resources/42655) | I can see reasoning (see shared area)  [NCETM mastery Y5](https://www.ncetm.org.uk/public/files/23305632/Mastery_Assessment_Y5_Low_Res.pdf)  [NCETM mastery y6](file:///C:\Users\USER\Downloads\Mastery_Assessment_Y6_Low_Res.pdf) |
| Possible misconceptions | * Pupils may not make the connection that a percentage is a different way of describing a proportion * Some pupils may read 0.234 as ‘nought point two hundred and thirty four’. This leads to the common misconception that, for example, 0.400 is a number larger than 0.76 | | |
| Assessment | <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/01/Primary_Spring_Mini_Assessments/Spring-Block-1-Year-6-Decimals_v2.pdf>  <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/01/Primary_Spring_Mini_Assessments/Spring-Block-2-Year-6-Percentages2.pdf>  <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/01/Primary_Spring_Mini_Assessments/Spring-Block-3-Year-5-Decimals-and-Percentages_Assessment.pdf> | | |
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**Y6 ONLY Algebra**

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| Link to WRMH small steps | * <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/10/Year-5-and-6-Mixed-Age-Spring-Block-3-Decimals-and-Algebra.pdf> | | |
| Key NC outcomes | * enumerate possibilities of combinations of two variables * express missing number problems algebraically * find pairs of numbers that satisfy an equation with two unknowns | | |
| Mathematical language | Algebra, algebraic, algebraically  Symbol  Expression  Variable  Substitute  Equation  Unknown  Enumerate |  |  |
| Useful resources - reasoning | NRICH: [Plenty of Pens](https://nrich.maths.org/1117)  NRICH: [Your Number Is…](http://nrich.maths.org/2289)  NRICH: [Number Pyramids](http://nrich.maths.org/2281)  NCETM: [Activity A: Racetrack and Design a board game](https://www.ncetm.org.uk/resources/42893)  NCETM: [Activity E: Matchbox Algebra](https://www.ncetm.org.uk/resources/42893) | NCETM: [Algebra](https://www.ncetm.org.uk/public/files/18416474/6_Progression_Map_Algebra_Reasoning.pdf) Reasoning (blue questions) | I can see reasoning (see shared area)  [NCETM mastery Y5](https://www.ncetm.org.uk/public/files/23305632/Mastery_Assessment_Y5_Low_Res.pdf)  [NCETM mastery y6](file:///C:\Users\USER\Downloads\Mastery_Assessment_Y6_Low_Res.pdf) |
| Possible misconceptions | * Some pupils may think that variables have a set value, such as *a* = 1, *b* = 2, *c*  = 3, *d* = 4, etc. (especially if they have done lots of poorly designed treasure hunts/codes) – this will lead to problems such as thinking ‘*b*2 ‘ is the same as ‘2*b*’ because when *b* = 2, *b*2 = 4 and 2*b* = 4. * Using the idea of ‘apples’ and ‘bananas’ to explain *a* + *b* = 14 can lead to misconceptions about the use of letters as variables. * Some students may think that the variables have to be positive integers (whole numbers) | | |
| Assessment | <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/01/Primary_Spring_Mini_Assessments/Spring-Block-3-Year-6-Algebra_Assessment.pdf> | | |

**Measurement – units of**

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| Link to WRMH small steps | * <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/10/Year-5-and-6-Mixed-Age-Spring-Block-4-Converting-Units.pdf> | | |
| Key NC outcomes | * 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 * use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling | | |
| Mathematical language | Length, distance  Mass, weight  Volume  Capacity  Metre, centimetre, millimetre  Kilogram, gram | Litre, millilitre  Hour, minute, second  Inch, foot, yard  Pound, ounce  Pint, gallon |  |
| Useful resources - reasoning | NRICH: [Olympic Starters](http://nrich.maths.org/8170)  NCETM: [Activity D - Converting between metric units](https://www.ncetm.org.uk/resources/42796)  NCETM: [Activity E- Converting between metric and imperial](https://www.ncetm.org.uk/resources/42796) | NCETM: [Measurement Reasoning](https://www.ncetm.org.uk/public/files/18436766/7_Progression_Map_Measurement_Reasoning.pdf) | I can see reasoning (see shared area)  [NCETM mastery Y5](https://www.ncetm.org.uk/public/files/23305632/Mastery_Assessment_Y5_Low_Res.pdf)  [NCETM mastery y6](file:///C:\Users\USER\Downloads\Mastery_Assessment_Y6_Low_Res.pdf) |
| Possible misconceptions | * Some pupils may apply incorrect beliefs about place value, such as 2.3 × 10 = 2.30. * Many conversions within the metric system rely on multiplying and dividing by 1000. The use of centimetres as an ‘extra unit’ within the system breaks this pattern. Consequently there is a frequent need to multiply and divide by 10 or 100, and this can cause confusion about the connections that need to be applied. * Some pupils may write amounts of money incorrectly; e.g. £3.5 for £3.50, especially if a calculator is used at any point | | |
| Assessment | <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/02/Primary_Spring_Mini_Assessments/Spring-Block-4-Mini-Assessment-Year-6-Converting-Measures.pdf>  <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/06/Year-5-Converting-Units-1.pdf> | | |

**Measurement – area and perimeter**

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| Link to WRMH small steps | * <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/10/Year-5-and-6-Mixed-Age-Spring-Block-5-Perimeter-Area-and-Volume.pdf> | | |
| Key NC outcomes | * 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 * estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water] * recognise that shapes with the same areas can have different perimeters and vice versa * calculate the area of parallelograms and triangles * calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³] * recognise when it is possible to use formulae for area and volume of shape * solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate | | |
| Mathematical language | Perimeter  Area  Volume  Capacity  Dimensions  Square, rectangle | Composite rectilinear  Polygon  Cube, cuboid  Millimetre, Centimetre, Metre, Kilometre  Square centimetre, square metre  Cubic centimetre, centimetre cube  Square unit |  |
| Useful resources - reasoning | NRICH: [Area and Perimeter](http://nrich.maths.org/7280)  NRICH: [Through the Window](https://nrich.maths.org/10344)  NRICH: [Numerically Equal](http://nrich.maths.org/public/viewer.php?obj_id=1045)  NRICH: [Cubes](http://nrich.maths.org/42) | NCETM**:** [Activity C: Through the window](https://www.ncetm.org.uk/resources/42805) | I can see reasoning (see shared area)  [NCETM mastery Y5](https://www.ncetm.org.uk/public/files/23305632/Mastery_Assessment_Y5_Low_Res.pdf)  [NCETM mastery y6](file:///C:\Users\USER\Downloads\Mastery_Assessment_Y6_Low_Res.pdf) |
| Possible misconceptions | * Some pupils may apply incorrect beliefs about place value, such as 2.3 × 10 = 2.30. * Many conversions within the metric system rely on multiplying and dividing by 1000. The use of centimetres as an ‘extra unit’ within the system breaks this pattern. Consequently there is a frequent need to multiply and divide by 10 or 100, and this can cause confusion about the connections that need to be applied. * Some pupils may write amounts of money incorrectly; e.g. £3.5 for £3.50, especially if a calculator is used at any point | | |
| Assessment | <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/03/Primary_Mini_Assessments/Spring-Block-5-Mini-Assessment-Year-6-Perimeter-Area-and-Volume.pdf>  <https://wrm-13b48.kxcdn.com/wp-content/uploads/2018/Mini_Assessments_Primary_Autumn/Year-5-Area-and-Perimeter.pdf> | | |

**Statistics**

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| Link to WRMH small steps | * <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/10/Year-5-and-6-Mixed-Age-Spring-Block-6-Statistics.pdf> | | |
| Key NC outcomes | * 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 * calculate and interpret the mean as an average | | |
| Mathematical language | Data  Scale  Axis  Graph  Frequency  Time graph, Time series  Line graph  Bar-line graph, vertical line chart  Maximum, minimum | Line graph  Pie chart  Sector  Angle  Protractor  Degrees | Average  Mean  Measure  Data  Statistic  Statistics  Approximate  Round |
| Useful resources - reasoning | NCETM: [Statistics Reasoning](https://www.ncetm.org.uk/public/files/18437062/10_Progression_Map_Statistics_Reasoning.pdf)  NRICH: [Birdwatch](http://nrich.maths.org/7553)  NRICH: [Probably …](http://nrich.maths.org/7245)  NRICH: [Same or Different?](http://nrich.maths.org/public/viewer.php?obj_id=1176) | NRICH: [Take Your Dog for a Walk](http://nrich.maths.org/4803)  NRICH: [Match the Matches](http://nrich.maths.org/public/viewer.php?obj_id=4937)  NRICH: [Graphing Number Patterns](http://nrich.maths.org/1174) | I can see reasoning (see shared area)  [NCETM mastery Y5](https://www.ncetm.org.uk/public/files/23305632/Mastery_Assessment_Y5_Low_Res.pdf)  [NCETM mastery y6](file:///C:\Users\USER\Downloads\Mastery_Assessment_Y6_Low_Res.pdf) |
| Possible misconceptions | * Some pupils may think that a line graph is appropriate for discrete data * Some pupils may think that a line graph is the same a bar-line chart * Some pupils may think that one centimetre represents one unit. * Some pupils may think the larger the size of the pie chart, the greater the total frequency * Some pupils may think if two pie charts have the same section then the amount of data the section represents is the same in each pie chart.’ * Some pupils may confuse the fact that the sections of the pie chart total 100% and 360° * Some pupils may think that a line graph is appropriate for discrete data * Some pupils may think that each square on the grid used represents one unit * If using a calculator some pupils may not use the ‘=’ symbol (or brackets) correctly; e.g. working out the mean of 2, 3, 4 and 5 as 2 + 3 + 4 + 5 ÷ 4 = 10.25. * Some pupils may think the average is always the middle number * Some pupils may think that the mean must be a whole number * Some pupils may not realise that the mean must lie within the range of the data set. | | |
| Assessment | <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/05/Year-6-Statistics.pdf> | | |

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| Link to WRMH small steps | * <https://wrm-13b48.kxcdn.com/wp-content/uploads/2020/03/2020/03/Year-5-and-6-Mixed-Age-Guidance-Summer-Block-1-Properties-of-Shape.pdf> | | |
| Key NC outcomes | * identify 3-D shapes, including cubes and other cuboids, from 2-D representations * 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 * 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 (total 360°); angles at a point on a straight line and 1/2 a turn (total 180°); other multiples of 90°# * recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles | | |
| Mathematical language | Cube  Cuboid  Cylinder  Pyramid  Prism  Cone  Sphere  2D  3D  Net  Sketch  Isometric paper | Quadrilateral, Square, Rectangle, Parallelogram, (Isosceles) Trapezium, Kite, Rhombus, Delta, Arrowhead  Triangle, Scalene, Right-angled, Isosceles, Equilateral  Polygon, Regular, Irregular  Pentagon, Hexagon, Octagon, Decagon, Dodecagon  Circle, Radius, Diameter, Circumference, Centre  Parallel  Diagonal  Angle | Turn  Angle  Degrees  Right angle  Acute angle  Obtuse angle  Reflex angle  Protractor  Vertically opposite |
| Useful resources - reasoning | NRICH: [The Third Dimension](http://nrich.maths.org/1148)  NRICH: [A Puzzling Cube](http://nrich.maths.org/1140)  NRICH: [Rolling That Cube](http://nrich.maths.org/7299)  NRICH: [Where Are They?](http://nrich.maths.org/public/viewer.php?obj_id=1058)  NRICH: [Round a Hexagon](http://nrich.maths.org/8095)  NRICH: [Quadrilaterals](http://nrich.maths.org/public/viewer.php?obj_id=962) | NCETM: [Geometry - Properties of Shapes Reasoning](https://www.ncetm.org.uk/public/files/18438967/8_Progression_Map_Geometry_properties_of_shapes_Reasoningv2.pdf)  NRICH: [Estimating Angles](http://nrich.maths.org/1235)  NCETM: [Activity A: Logo Challenge 1 – Star Square](https://www.ncetm.org.uk/resources/42849)  NCETM: [Activity C: Equal angles](https://www.ncetm.org.uk/resources/42849)  NCETM: [Activity D: Sorting triangles](https://www.ncetm.org.uk/resources/42849) | I can see reasoning (see shared area)  [NCETM mastery Y5](https://www.ncetm.org.uk/public/files/23305632/Mastery_Assessment_Y5_Low_Res.pdf)  [NCETM mastery y6](file:///C:\Users\USER\Downloads\Mastery_Assessment_Y6_Low_Res.pdf) |
| Possible misconceptions | * Pupils must have isometric paper in portrait orientation for it to work correctly. * When drawing a cube on isometric paper, some students may think that they need to join dots to make a square first, and will draw horizontal and vertical lines to attempt to achieve this * Correct use of isometric paper must not indicate ‘hidden’ lines# * Some pupils may think that a ‘regular’ polygon is a ‘normal’ polygon * Some pupils may think that all polygons have to be regular * Some pupils may think that a square is only square if ‘horizontal’, and even that a ‘non-horizontal’ square is called a diamond * The equal angles of an isosceles triangle are not always the ‘base angles’ as some pupils may think * Some pupils use the wrong scale on a protractor. For example, they measure an obtuse angle as 60° rather than 120°. * Some pupils may think that 90° is either an acute or obtuse angle. * Some pupils may think it is not possible to measure a reflex angle. * Some pupils may think that these angles are not equal as they are not ‘vertical’.   x  x   * Some pupils may think that angles that are ‘roughly’ opposite are always equal, e.g. a = c   aa  b  d  c | | |
| Assessment | <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/04/2019/04/2019/04/Year-6-Properties-of-Shape.pdf>  <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/04/Year-5-Properties-of-Shape.pdf> | | |

**Properties of shape**

**Position and direction**

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| Link to WRMH small steps | * <https://wrm-13b48.kxcdn.com/wp-content/uploads/2020/03/2020/03/Year-5-and-6-Mixed-Age-Guidance-Summer-Block-2-Position-and-Direction.pdf> | | |
| Key NC outcomes | * 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 | | |
| Mathematical language | 2-D  Grid  Axis, axes, x-axis, y-axis  Origin  (First) quadrant  (Cartesian) coordinates  Point  Translation  Reflection  Transformation  Object, Image  Congruent, congruence | Quadrilateral, Square, Rectangle, Parallelogram, (Isosceles) Trapezium, Kite, Rhombus, Delta, Arrowhead  Triangle, Scalene, Right-angled, Isosceles, Equilateral  Polygon, Regular, Irregular  Pentagon, Hexagon, Octagon, Decagon, Dodecagon  Circle, Radius, Diameter, Circumference, Centre  Parallel  Diagonal  Angle |  |
| Useful resources - reasoning | NRICH: [Transformations on a Pegboard](http://nrich.maths.org/public/viewer.php?obj_id=1813)  NRICH: [Square Corners](http://nrich.maths.org/public/viewer.php?obj_id=1142) NCETM: [Activity A: Translation or Destination](https://www.ncetm.org.uk/resources/42944) NCETM: [Geometry: Position Direction and Movement Reasoning](https://www.ncetm.org.uk/public/files/18436990/9_Progression_Map_Geometry_position_direction_and_movement_Reasoning.pdf) | NRICH: [Cops and Robbers](http://nrich.maths.org/public/viewer.php?obj_id=6288)  NRICH: [Eight Hidden Squares](http://nrich.maths.org/public/viewer.php?obj_id=6280)  NRICH: [Coordinate Tan](http://nrich.maths.org/public/viewer.php?obj_id=1109)  NRICH: [Transformation Tease](http://nrich.maths.org/1111)  NCETM: [Activity B - Battleships](https://www.ncetm.org.uk/resources/42950) | I can see reasoning (see shared area)  [NCETM mastery Y5](https://www.ncetm.org.uk/public/files/23305632/Mastery_Assessment_Y5_Low_Res.pdf)  [NCETM mastery y6](file:///C:\Users\USER\Downloads\Mastery_Assessment_Y6_Low_Res.pdf) |
| Possible misconceptions | * When describing or carrying out a translation, some pupils may count the squares between the two shapes rather than the squares that describe the movement between the two shapes. * When carrying out a reflection some pupils may think that the object and image should be an equal distance from the edge of the grid, rather than an equal distance form the mirror line. * Some pupils will confuse the order of x-coordinates and y-coordinates * When constructing axes, some pupils may not realise the importance of equal divisions on the axes | | |
| Assessment | <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/05/Year-5-Position-and-direction-1.pdf>  <https://wrm-13b48.kxcdn.com/wp-content/uploads/2018/Mini_Assessments_Primary_Autumn/Year-6-Position-and-Direction.pdf> | | |

**Fractions**

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| Link to WRMH small steps | * <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/SoLs/Primary/MixedAge/Year-5-and-6-Mixed-Age-Autumn-Block-3-Fractions.pdf> | | |
| Key NC outcomes | * 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 * use common factors to simplify fractions; use common multiples to express fractions in the same denomination * compare and order fractions, including fractions > 1 * associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8] * 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 * multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams * 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 * solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates | | |
| Mathematical language | Fraction  Numerator  Denominator  Improper fraction, Proper fraction, Vulgar fraction, Top-heavy fraction | Simplify  Equivalent  Lowest terms |  |
| Useful resources - reasoning | NRICH: [Matching fractions](http://nrich.maths.org/8283)  NRICH: [Fractions made faster](http://nrich.maths.org/4561)  NCETM: [Fractions Reasoning](https://www.ncetm.org.uk/public/files/18416412/4_Progression_Map_Fractions_Reasoning_.pdf) (questions in blue) | NRICH: [Forgot the Numbers](http://nrich.maths.org/public/viewer.php?obj_id=1015)  NCETM: [Activity A - Fractions ITP](https://www.ncetm.org.uk/resources/42655)  NRICH: [Fractions Jigsaw](http://nrich.maths.org/public/viewer.php?obj_id=5467&part=index&refpage=monthindex.php)  NRICH: [Peaches Today, Peaches Tomorrow](http://nrich.maths.org/2312/index)  NRICH: [Andy’s Marbles](http://nrich.maths.org/public/viewer.php?obj_id=2421)  NRICH: [Would you Rather?](http://nrich.maths.org/public/viewer.php?obj_id=1118) | I can see reasoning (see shared area)  [NCETM mastery Y5](https://www.ncetm.org.uk/public/files/23305632/Mastery_Assessment_Y5_Low_Res.pdf)  [NCETM mastery y6](file:///C:\Users\USER\Downloads\Mastery_Assessment_Y6_Low_Res.pdf) |
| Possible misconceptions | * Some pupils may think that equivalent fractions are found using an additive relationship rather than a multiplicative one: for example, that the fraction 4/5 is equivalent to 6/8 * A fraction can be visualised as divisions of a shape (especially a circle) but some pupils may not recognise that these divisions must be equal in size, or that they can be divisions of any shape. * Pupils may think that the larger the numerator / denominator the larger the fraction and vice versa * Some pupils may think that simplifying a fraction just requires searching for, and removing, a factor of 2 (repeatedly) * Some pupils may think that you simply add the numerators and add the denominators when adding fractions. * Some pupils may think that you simply subtract the numerators and subtract the denominators when subtracting fractions. * Some pupils may think that you simply multiply both the numerator denominator when multiplying a fraction by a whole number. * Some pupils may think that you simply multiply the whole number and then the fraction when multiplying a mixed number by a whole number, e.g. | | |
| Assessment | <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/01/Primary_Spring_Mini_Assessments/Spring-Block-2-Year-5-fractions-A.pdf>  <https://wrm-13b48.kxcdn.com/wp-content/uploads/2019/01/Primary_Spring_Mini_Assessments/Spring-Block-2-Year-5-Fractions-B.pdf>  <https://wrm-13b48.kxcdn.com/wp-content/uploads/2018/11/Year-6-Fractions-A-1.pdf>  <https://wrm-13b48.kxcdn.com/wp-content/uploads/2018/11/Year-6-Fractions-B.pdf> | | |