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| Year 6 | **Recall:****Children should be able to derive and recall** | **Mental calculation skills:****Working mentally, with jottings if needed, children should be able to** | **Mental methods or strategies:****Children should understand when to and be able to apply these strategies** | **GUIDANCE DOCUMENTS** |
| Mental Arithmetic KPIsTables and known facts | **Addition and Subtraction*** addition and subtraction facts for multiples of 10 to 1000 and decimal numbers with one decimal place, e.g. 650 +  = 930,  – 1.4 = 2.5
* what must be added to a decimal with units, tenths and hundredths to make the next whole number, e.g. 7.26 +  = 8
 | **Addition and Subtraction*** add or subtract pairs of decimals with units, tenths or

hundredths, e.g. 0.7 + 3.38* find doubles of decimals each with units and tenths,

e.g. 1.6 + 1.6* add near doubles of decimals, e.g. 2.5 + 2.6
* add or subtract a decimal with units and tenths, that is

nearly a whole number, e.g. 4.3 + 2.9, 6.5 – 3.8 | **Addition and Subtraction*** count on or back in hundreds, tens, ones, tenths and hundredths
* use knowledge of place value and related calculations, e.g. 680 + 430, 6.8 + 4.3, 0.68 + 0.43 can all be worked out using the related calculation 68 + 43
* use knowledge of place value and of doubles of two-digit whole numbers
* partition: double and adjust
* partition: add or subtract a whole number and adjust, e.g. 4.3 + 2.9 = 4.3 + 3 – 0.1, 6.5 – 3.8 = 6.5 – 4 + 0.2
* partition: count on or back in minutes and hours, bridging through 60 (analogue and digital times, 12-hour and 24- hour clock)
 | 1. [**Teaching Children to Calculate Mentally**](file:///%5C%5C2523dc01%5Cteares%24%5CCurriculum%5CMaths%5CMedium%20Term%20planning%5CTeaching%20Children%20to%20Calculate%20Mentally.pdf)
2. [**Written Calculation Policy**](file:///%5C%5C2523dc01%5Cteares%24%5CCurriculum%5CMaths%5CTalavera%20Calculation%20Policy%5CTalavera%20Written%20Calculation%20Policy.pptx)
3. [**Mental Calculation Policy**](file:///%5C%5C2523dc01%5Cteares%24%5CCurriculum%5CMaths%5CTalavera%20Calculation%20Policy%5CTalavera%20Mental%20Calculation%20Policy.docx)
4. [**NCETM Spines**](https://www.ncetm.org.uk/resources/50639)
5. [**Ready to Progress Criteria**](https://www.ncetm.org.uk/classroom-resources/exemplification-of-ready-to-progress-criteria/)
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|  | **Multiplication and Division*** squares to 12 × 12
* squares of the corresponding multiples of 10
* prime numbers less than 100
* equivalent fractions, decimals and percentages for hundredths, e.g. 35% is equivalent to 0.35 or 35 100
 | **Multiplication and Division*** multiply pairs of two-digit and single-digit numbers,

e.g. 28 × 3* divide a two-digit number by a single-digit number, e.g.

68 ÷ 4* divide by 25 or 50, e.g. 480 ÷ 25, 3200 ÷ 50
* double decimals with units and tenths, e.g. double 7.6,

and find the corresponding halves, e.g. half of 15.2* multiply pairs of multiples of 10 and 100, e.g. 50 × 30,

600 × 20* divide multiples of 100 by a multiple of 10 or 100 (whole

number answers), e.g. 600 ÷ 20, 800 ÷ 400, 2100 ÷ 300* multiply and divide two-digit decimals such as 0.8 × 7,

4.8 ÷ 6* find 10% or multiples of 10%, of whole numbers and

quantities, e.g. 30% of 50 ml, 40% of £30, 70% of 200 g* simplify fractions by cancelling
* scale up and down using known facts, e.g. given that

three oranges cost 24p, find the cost of four oranges* identify numbers with odd and even numbers of factors

and no factor pairs other than 1 and themselves | **Multiplication and Division*** partition: use partitioning and the distributive law to divide tens and ones separately, e.g.

92 ÷ 4 = (80 + 12) ÷ 4* + - = 20 + 3 = 23
* form an equivalent calculation, e.g. to divide by 25, divide by 100, then multiply by 4; to divide by 50, divide by 100, then double
* use knowledge of the equivalence between fractions and percentages and the relationship between fractions and division
* recognise how to scale up or down using multiplication and division, e.g. if three oranges cost 24p:

one orange costs 24 ÷ 3 = 8p four oranges cost 8 × 4 = 32p* Use knowledge of multiplication and division facts to identify factor pairs and numbers with only two factors
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| Year 6 | Phase 1 | Phase 2 | Phase 3 (no phase 4 assessment due to SATs testing) |
| Areas to revise | Year 5 KPIs  | Phase 1 according to AFL | Phase 2 according to AFL |
| KPIs covered | **Phase 1:****Place Value*** Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit.
* Round any whole number to a required degree of accuracy.
* Solve number and practical problems involving place value knowledge
* Use negative numbers in context and calculate intervals across zero

**Addition and Subtraction*** Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

**Multiplication and Division*** Identify common factors, common multiplies and prime numbers
* 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

**Calculation*** Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
* Perform mental calculations, including with mixed operations and large numbers
* Solve problems involving, addition, subtraction, multiplications and division

**Algebra*** Use simple formulae

**Measure*** Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from smaller units of measure
 | **Phase 2:****Algebra*** Express missing number problems algebraically and find numbers that satisfy number sentences

**Fractions and Decimals*** Solve problems which require answers to be rounded to specified degrees of accuracy
* Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts
* Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
* Compare and order fractions, including fractions >1
* Use written division methods in cases where the answer has up to two decimal places

**Ratio and proportions*** Solve problems involving the calculation of percentages (e.g. of measures) such as 15% of 360 and the use of percentages for comparison

**Statistics*** Interpret and construct pie charts and line graphs and use these to solve problems
* Calculate and interpret the mean as an average
* Complete, read and interpret information in tables, including timetables.
* Solve comparison, sum and difference problems using information presented in a time graph
 | **Phase 3:****Place Value*** Read Roman numerals to 1000 and recognise years written in Roman numerals

**Calculation*** Use their knowledge of the order of operations to carry out calculations involving four operations

**Ratio and proportions*** 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

**Measure*** Estimate volume (e.g. using 1 cm3 blocks to build cubes and cuboids) and capacity (e.g. using water)
* 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
* Solve problems involving converting between units of time
* Recognise that shapes with the same areas can have different perimeters
* Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate
* Recognise when it is possible to use formulae for area and volume of shapes

**Fractions and Decimals*** Multiply simple pairs of proper fractions, writing the answer in its simplest form
* Divide proper fractions by whole numbers

**Geometry** * Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
* Draw 2-D shapes using given dimensions and angles
* Use the properties of rectangles to deduce related facts and find missing lengths and angles
* Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
* Draw given angles, and measure them in degrees (o)
* Recognise describe and build simple 3-D shapes
* Describe positions on the full coordinates grid ( all four quadrants)
* Draw and translate simple shapes on the coordinate plane, and reflect them in the axis
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| **See Calculation Policy for Formal Strategies** |

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| Key vocab | **Place Value**units, ones, tens, hundreds, digit, one-, two- or three-digit number, ‘teens’ numberplace, place value, stands for, represents, exchange, the same number as, as many as, equal toOf two objects/amounts:greater, more, larger, bigger, less, fewer, smallerOf three or more objects/amounts:greatest, most, biggest, largest, least, fewest, smallestone more, ten more, one hundred more, one less, ten less, one hundred lesscompare, order, sizefirst, second, third… tenth… twentieth, twenty-first, twenty-second…last, last but one, before, after, next, between, half-way between above, below | **Addition & Subtraction**, add, addition, more, plus, make, sum, total, altogether, score, double, near double, one more, two more... ten more... one hundred more, how many more to make…? how many more is… than…?how much more is…?subtract, subtraction, take (away), minus, leave, how many are left/left over? one less, two less… ten less… one hundred lesshow many fewer is… than…? how much less is…?difference between, half, halveadditionequals, sign, is the same astens boundary, hundreds boundaryunitise**Minuend - Subtrahend = Difference** | **Multiplication and Division**lots of, groups of, , times, multiply, multiplication, multiplied by, multiple of, productonce, twice, three times… ten times…times as (big, long, wide… and so on),repeated addition, array, row, column, double, halve, share, share equally, one each, two each, three each…group in pairs, threes… tens, equal groups of, , divide, division, divided by, divided into, left, left over, remaindermultiplicationhttps://www.mathsisfun.com/images/definition-division1.gifhttps://www.mathsisfun.com/images/definition-division2.gif**Fractions**EquivalentNumerator, Denominatorpart, equal parts, fraction, one whole, one half, two halvesone quarter, two… three… four quarters, one third, two thirds, three thirds, one tenth | **Measure****Measure**CompareAdd and SubtractPerimeterLengthsMetres, Centimetres, MillimetresMassKilograms, GramsVolumeLitres, MillilitresAnalogue ClockMorning, Afternoon, Noon, Midnight Seconds, Minutes, HoursO’clock, am, pm Roman Numerals**Statistics**2D shapes, 3D shapesRecognise OrientationsDescribeAnglesRight anglesDegrees½ turn, ¾ turn, Complete turnGreater than, Less thanHorizontal linesVertical linesPerpendicular linesParallel lines**Geometry****shape, pattern, flat, curved, straight, round, hollow, solid, corner, point, pointed, face, side, edge, end, sort, make, build, draw, surface****right-angled, vertex, vertices, layer, diagram, cube, cuboid, pyramid****sphere, hemi-sphere, cone, cylinder, prism, circle, circular, semi-circle, triangle, triangular, square, rectangle, rectangular****star, pentagon, pentagonal, hexagon, hexagonal, octagon, octagonal****quadrilateral** |