Maths   MTP Year 6

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 KPIs Tables 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](#) 2. [Written Calculation Policy](#) 3. [Mental Calculation Policy](#) 4. [NCETM Spines](#) 5. [Ready to Progress Criteria](#)
	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 $\frac{35}{100}$	**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	

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

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KPIs covered	**Phase 1:**	**Phase 2:**	**Phase 3:**
	Place Value	**Algebra**	**Place Value**
	• Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit.	• Express missing number problems algebraically and find numbers that satisfy number sentences	• Read Roman numerals to 1000 and recognise years written in Roman numerals
	• Round any whole number to a required degree of accuracy.	**Fractions and Decimals**	**Calculation**
	• Solve number and practical problems involving place value knowledge	• Solve problems which require answers to be rounded to specified degrees of accuracy	• Use their knowledge of the order of operations to carry out calculations involving four operations
	• Use negative numbers in context and calculate intervals across zero	• Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts	**Ratio and proportions**
	Addition and Subtraction	• Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions	• Solve problems involving similar shapes where the scale factor is known or can be found
	• Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	• Compare and order fractions, including fractions >1	• Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples
	Multiplication and Division	• Use written division methods in cases where the answer has up to two decimal places	**Measure**
	• Identify common factors, common multiplies and prime numbers	**Ratio and proportions**	• Estimate volume (e.g. using 1 cm³ blocks to build cubes and cuboids) and capacity (e.g. using water)
	• 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 the calculation of percentages (e.g. of measures) such as 15% of 360 and the use of percentages for comparison	• 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
	• 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	**Statistics**	• Solve problems involving converting between units of time
	Calculation	• Interpret and construct pie charts and line graphs and use these to solve problems	• Recognise that shapes with the same areas can have different perimeters
	• Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy	• Calculate and interpret the mean as an average	• Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate
	• Perform mental calculations, including with mixed operations and large numbers	• Complete, read and interpret information in tables, including timetables.	• Recognise when it is possible to use formulae for area and volume of shapes
	• Solve problems involving, addition, subtraction, multiplications and division	• Solve comparison, sum and difference problems using information presented in a time graph	**Fractions and Decimals**
	Algebra		• Multiply simple pairs of proper fractions, writing the answer in its simplest form
	• Use simple formulae		• Divide proper fractions by whole numbers
	Measure		**Geometry**
	• Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from smaller units of measure		• 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 (°)
			• 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

See Calculation Policy for Formal Strategies

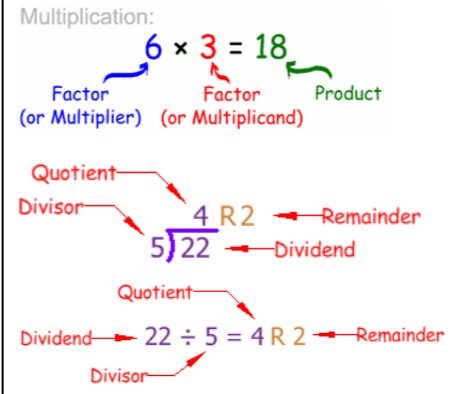| Key vocab	**Place Value**	**Addition & Subtraction**	**Multiplication and Division**	**Measure**

units, ones, tens, hundreds, digit, one-, two- or three-digit number, 'teens' number
place, place value, stands for, represents, exchange, the same number as, as many as, equal to
Of two objects/amounts:
greater, more, larger, bigger, less, fewer, smaller
Of three or more objects/amounts:
greatest, most, biggest, largest, least, fewest, smallest
one more, ten more, one hundred more, one less, ten less, one hundred less
compare, order, size
first, second, third… tenth… twentieth, twenty-first, twenty-second…
last, last but one, before, after, next, between, half-way between above, below

, 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 less
how many fewer is… than…? how much less is…?
difference between, half, halve
equals, sign, is the same as
tens boundary, hundreds boundary
unitise

Addition:

$8 + 3 = 11$
Addend   Addend   Sum

$8 - 3 = 5$
Minuend   Subtrahend   Difference
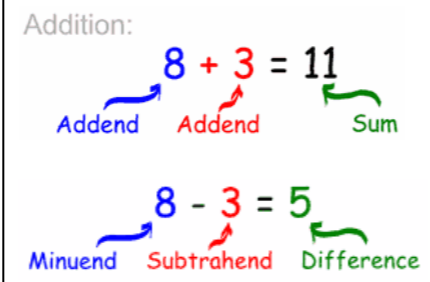
lots of, groups of, , times, multiply, multiplication, multiplied by, multiple of, product
once, twice, three times… ten times…times as (big, long, wide… and so on),repeated addition, array, row, column, double, halve, share, share equally, one each, two each, three each…group in pairs, threes… tens, equal groups of, , divide, division, divided by, divided into, left, left over, remainder

Multiplication:

$6 \times 3 = 18$
Factor   Factor   Product
(or Multiplier)   (or Multiplicand)

Quotient
Divisor
$5\overline{)22}$ 4 R 2   Remainder
Dividend

Quotient
Dividend → $22 \div 5 = 4$ R 2 ← Remainder
Divisor

Fractions

Equivalent
Numerator, Denominator

part, equal parts, fraction, one whole, one half, two halves
one quarter, two… three… four quarters, one third, two thirds, three thirds, one tenth

Measure
Compare
Add and Subtract
Perimeter
Lengths
Metres, Centimetres, Millimetres
Mass
Kilograms, Grams
Volume
Litres, Millilitres
Analogue Clock
Morning, Afternoon, Noon, Midnight Seconds, Minutes, Hours
O'clock, am, pm
Roman Numerals

Statistics
2D shapes, 3D shapes
Recognise
Orientations
Describe
Angles
Right angles
Degrees
½ turn, ¾ turn, Complete turn
Greater than, Less than
Horizontal lines
Vertical lines
Perpendicular lines
Parallel 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