

Numbers and 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
- use negative numbers in context, and calculate intervals across zero
- solve number and practical problems that involve all of the above.

Fractions and Decimals and Percentages

- use common factors to simplify fractions; use common multiples to express fractions in the same denomination
- compare and order fractions, including fractions > 1
- add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
- multiply simple pairs of proper fractions, writing the answer in its simplest form
- divide proper fractions by whole numbers
- associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction
- 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

Ratio and proportion

- solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts
- solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison
- 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.

Algebra

- use simple formulae
- generate and describe linear number sequences
- express missing number problems algebraically
- find pairs of numbers that satisfy an equation with two unknowns
- enumerate possibilities of combinations of two variables.

Multiplication, Division, Addition and Subtraction

- 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
- 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
- perform mental calculations, including with mixed operations and large numbers
- identify common factors, common multiples and prime numbers
- use their knowledge of the order of operations to carry out calculations involving the four operations
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- solve problems involving addition, subtraction, multiplication and division
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

Geometry

- draw 2-D shapes using given dimensions and angles
- recognise, describe and build simple 3-D shapes, including making nets
- 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
- recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.
- 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.

Measurement

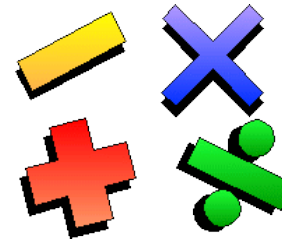
- solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate
- use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation up to three decimal places
- convert between miles and kilometres
- recognise that shapes with the same areas can have different perimeters and vice versa
- recognise when it is possible to use formulae for area and volume of shapes
- 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].

Statistics

- interpret and construct pie charts and line graphs and use these to solve problems
- calculate and interpret the mean as an average.



Woodfall Primary School



Year 6

Mathematics

Calculation Strategies



This leaflet aims to inform you of some calculation strategies that your children will be using in school. This will hopefully aid the completion of homework. However, the strategies used will be dependant on what is needed by your child and not all strategies will be necessarily be used.

ADDITION

Column addition

$$\begin{array}{r} 625 \\ + 48 \\ \hline 673 \\ 1 \end{array}$$
$$\begin{array}{r} 783 \\ + 42 \\ \hline 825 \\ 1 \end{array}$$
$$\begin{array}{r} 367 \\ + 85 \\ \hline 452 \\ 11 \end{array}$$

Leading to decimal numbers and more than two numbers.

$$\begin{array}{r} 65.8 \\ + 58.48 \\ \hline 124.28 \\ 11 \end{array}$$
$$\begin{array}{r} 42 \\ 6432 \\ 786 \\ 3 \\ \hline 4681 \\ 11944 \\ 121 \end{array}$$

SUBTRACTION

Column subtraction—with exchanging (not borrowing)

Numbers should continue to be referred to by their values and not their digits.

e.g. 140 - 80 or 14 tens - 8 ones as opposed to 14 - 8

$$\begin{array}{r} 7 \ 14 \ 1 \\ 8 \ 5 \ 4 \\ - 2 \ 8 \ 6 \\ \hline 5 \ 6 \ 8 \end{array}$$

Leading to decimal numbers.

$$\begin{array}{r} 2 \ 13 \ 16 \ 11 \ 1 \\ \cancel{7} \ 4 \cancel{7} \ . \cancel{7} \ 6 \\ - 1 \ 8 \ 9 \ . \ 5 \ 8 \\ \hline 1 \ 5 \ 7 \ . \ 6 \ 8 \end{array}$$

This should be extended to exchange across two places due to the presence of a zero.

$$\begin{array}{r} 5 \ 1 \ 1 \\ \cancel{5} \ \cancel{0} \ 5 \\ - 3 \ 2 \ 8 \\ \hline 2 \ 7 \ 7 \end{array}$$

MULTIPLICATION

Grid method— decimal numbers

$$4.92 \times 3 = 14.76$$

x	4	0.9	0.02	
3	12	2.7	0.06	14.76

Short Multiplication

$\begin{array}{r} 38 \\ \times 7 \\ \hline 56 \quad (8 \times 7) \\ \underline{210} \quad (30 \times 7) \\ \hline 266 \end{array}$	$\begin{array}{r} 38 \\ \times 7 \\ \hline 266 \\ \hline 1 \end{array}$
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Long Multiplication

LONG MULTIPLICATION

$\begin{array}{r} 38 \\ \times 57 \\ \hline 266 \\ \underline{1900} \\ \hline 2166 \end{array}$	$\begin{array}{r} 423 \\ \times 68 \\ \hline 3384 \\ \underline{25380} \\ \hline 28764 \end{array}$
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DIVISION

Short division—using short method also known as bus stop.

$$468 \div 3 = 156$$

$$\begin{array}{r} 156 \\ 3 \overline{)468} \end{array}$$

$$222 \div 6 = 37$$

$$\begin{array}{r} 037 \\ 6 \overline{)222} \end{array}$$

Short division with remainders - representing remainders as whole numbers, decimals an fractions

$$3992 \div 16 = 249 \text{ remainder } 8$$

$\begin{array}{r} 0249 \text{ r } 8 \\ 16 \overline{)13992} \end{array}$	or	$\begin{array}{r} 0249 \text{ } 8/16 = 249 \frac{1}{2} \\ 16 \overline{)13992} \end{array}$	or	$\begin{array}{r} 0249.5 \\ 16 \overline{)13992.0} \end{array}$
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Long division

$\begin{array}{r} 2191 \\ 4 \overline{)8764} \\ \underline{8} \downarrow \\ 07 \downarrow \\ \underline{4} \downarrow \\ 36 \downarrow \\ \underline{36} \downarrow \\ 04 \\ \underline{4} \\ 0 \end{array}$	$\begin{array}{r} 21 \\ 216 \overline{)4536} \\ \underline{432} \downarrow \\ 216 \\ \underline{216} \\ 0 \end{array}$	$\begin{array}{r} 17 \text{ r } 19 \\ 31 \overline{)546} \\ \underline{31} \downarrow \\ 236 \\ \underline{217} \\ 19 \end{array}$
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