

Number - Calculating

Foundation Phase - Range	Nursery	Reception	Year 1	Year 2	KS2 - Range	Year 3	Year 4
<p>Investigate patterns and relationships:</p> <p><i>Begin to understand the relationships between addition and subtraction, between multiplication and division, and between halving and doubling.</i></p> <p>Calculate in a variety of ways:</p> <p><i>Begin to develop mental calculation strategies during counting and grouping activities, games and through day-to-day classroom activities</i></p> <p><i>Progress from counting on or back in steps, to mental mathematics involving all four operations with small numbers, using their own methods to record their calculations</i></p>	<p><i>Use mathematics in day-to-day activities and in play, responding appropriately to key vocabulary and questions.</i></p> <p>In practical situations, find the total number of items in 2 groups by counting all of them.</p> <p>In practical situations remove some objects from a group and count how many are left.</p>	<p>In practical activities and discussion, use the vocabulary involved in adding and subtracting. Use familiar words in practical situations.</p> <p>Relate addition to combining 2 groups of objects, <i>carry out simple addition using 1 to 5 and understand that zero means none.</i></p> <p>Take a smaller number from a larger one by counting back.</p> <p>Begin to relate addition to counting on and subtraction to 'taking away'.</p> <p>Begin to count objects in twos.</p> <p>Share objects in play situations.</p>	<p>Use the vocabulary related to the four operations. <i>Use mathematics as an integral part of classroom activities.</i></p> <p>Know that more than two numbers can be added together.</p> <p><i>Add and subtract numbers when solving problems involving up to 10 objects.</i></p> <p>Understand addition as combining sets to make a total and steps along a number track, and subtraction as 'take away' or 'difference'.</p> <p><i>Represent work with objects or pictures and discuss it.</i></p> <p>Group objects into twos, fives and tens.</p> <p>Count in 2s, 5s and 10s.</p> <p>Share sets of objects in practical situations.</p>	<p>Use and begin to read vocabulary related to the four operations. <i>Talk about work using familiar mathematical language.</i></p> <p><i>Use mental recall of number facts to 10 to add or subtract larger numbers.</i></p> <p>Understand addition as counting steps on a number line and subtraction as taking away, difference and complementary addition.</p> <p>Know that addition can be done in any order. Begin to understand that addition reverses subtraction.</p> <p>Check addition and multiplication calculations by doing them in a different order.</p> <p>Record mental additions / subtractions in a number sentence using +, - and = <i>Represent work using symbols and simple diagrams.</i></p> <p>Understand multiplication as repeated addition or as describing an array.</p> <p>Know and use halving as the inverse of doubling.</p> <p>Begin to understand division as grouping, repeated subtraction or sharing.</p> <p><i>Identify and use halves and quarters in practical situations – shapes and sets of objects. Recognise simple equivalences.</i></p>	<p>Investigate patterns and relationships:</p> <p><i>Explore the inverse relationships of addition and subtraction, and of multiplication and division.</i></p> <p>Calculate in a variety of ways:</p> <p><i>Use the relationships between the four operations, including inverses; recognise situations to which the different operations apply</i></p> <p><i>Use a variety of mental methods of computation; extend informal written methods to non-calculator methods</i></p> <p><i>Use fractions and percentages to estimate, describe and compare proportions of a whole.</i></p>	<p>Use and read vocabulary related to the four operations. <i>Talk about and explain their work.</i></p> <p>Continue to develop understanding of addition as counting on steps along a number line. Understand subtraction as taking away, difference and complementary addition.</p> <p>Know that subtraction is not commutative. Know that addition reverses subtraction.</p> <p>Check subtraction with addition, halving with doubling, division with multiplication.</p> <p>Use jottings to help mental calculations. <i>Use and interpret mathematical symbols and diagrams.</i></p> <p>Understand the operation of multiplication as repeated addition. Know that multiplication can be done in any order. Recognise that + is inverse of x and that halving is the inverse of doubling. Use knowledge of doubling and halving to multiply and divide.</p> <p>Understand division as grouping, repeated subtraction or sharing. Understand the idea of a remainder in practical situations. Know that division is not commutative.</p> <p>Recognise unit fractions such as $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{10}$ and use them to find fractions of shapes and numbers</p>	<p><i>Organise their work, check results, and try different approaches.</i></p> <p>Know that when a larger number is subtracted from a smaller one, the answer is negative.</p> <p>Explain and use the principles of the commutative and associative laws as they apply to addition.</p> <p>Use the inverse to check results.</p> <p>Use informal and pencil and paper methods. Begin to develop efficient standard methods that can be applied generally.</p> <p>Know that larger numbers can be partitioned to make multiplication easier.</p> <p>Understand division as sharing equally or grouping. Find whole number remainders after division. Begin to relate division to fractions.</p> <p>Recognise the equivalence of simple fractions. Use fraction notation. Order familiar fractions.</p> <p>Recognise simple fractions that are several parts of a whole</p>

	<p>Show curiosity about numbers by offering comments or asking questions.</p> <p>Understand the concept of one more.</p>	<p>Use developing mathematical ideas and methods to solve practical number problems.</p> <p>Know by heart all pairs of numbers that total 5.</p> <p>Add doubles by counting on.</p> <p>Understand the concept of one less. Find one more or one less than an number from 1-10.</p> <p>In practical situations recognise that 2+3 is the same as 3+2 Partition a set of objects into two groups.</p>	<p>Use mental strategies to solve simple problems Explain methods and reason orally.</p> <p>Know by heart all pairs of numbers that total 10.</p> <p>Understand double and halve in practical contexts. Know addition doubles by heart to at least 5+5</p> <p>Say a number that is one more/less than a given number to 20.</p> <p>Add 9 to single-digit numbers by adding 10 then subtracting 1.</p> <p>Put the larger number first in order to count on more efficiently. Partition numbers into "5 and a bit".</p> <p>Use known number facts and place value to mentally: +/- pairs of numbers to 10; +/- single digit to/from teens number;</p>	<p>Choose appropriate operations when solving addition and subtraction problems. Use mental calculation strategies to solve number, money and measure problems.</p> <p>Know by heart all pairs of numbers that total 20 and pairs of multiples of 10 that total 100.</p> <p>Know addition doubles up to 15+15. Halve even numbers to 20. Identify near doubles.</p> <p>Know by heart multiplication facts for the 2 and 10 times tables and derive quickly the corresponding division facts.</p> <p>Say a number that is 1 or 10 more/less than any 2-digit number.</p> <p>Mentally add / subtract 11 or 21, or 9 or 19, to/ from any 2-digit number by using next multiple of 10 and adjusting.</p> <p>Find a small difference between a pair of numbers lying either side of a multiple of 10 by counting up.</p> <p>Add three numbers by putting largest first, finding pairs to make 10. Partition into tens and units.</p> <p>Use known number facts and place value to mentally: +/- single digit and teens number and 10 to/from 2 digit number; +/- pairs of multiples of 10; x single digits by 1 or 10; ÷ 2 digit multiple of 10 by 1 or 10.</p>	<p>Calculate fractions and percentages of quantities.</p>	<p>Choose and use appropriate operations to solve word problems, and appropriate ways of calculating: mental, mental with jottings, pencil and paper. Explain methods and reasoning.</p> <p>Know by heart all addition and subtraction facts for each number to at least 20 and pairs of multiples of 100 that total 1000.</p> <p>Derive quickly doubles to 20+20 and multiples of 5 to 100+100. Halve any multiple of 10 to 100 Identify and use near doubles.</p> <p>Know by heart all multiplication facts for 2, 5, 10 x tables and derive quickly the corresponding division facts.</p> <p>Say a number that is 1, 10 or 100 more/less than any 3-digit number.</p> <p>Mentally add / subtract 11, 21.....or 9,19to/ from any 2-digit number by using multiples of 10 and adjusting.</p> <p>Find a small difference by counting up through the next multiple of 100.</p> <p>Add several numbers by putting largest first, finding pairs to make 10, pairs to make 9 or 11 and adjusting. Partition into tens and units.</p> <p>Use known number facts and place value to mentally: +/- single digit to/from 3-digit number; +/- 2-digit number from multiple of 10 / 100; +/- pairs of 2-digit numbers and pairs of multiples of 10 / 100; x single digits by 1, 10, 100; ÷ 3 digit multiple of 100 by 10 or 100.</p>	<p>Begin to relate fractions to division and recognise the equivalence between the decimal and fraction form of $\frac{1}{2}$, $\frac{1}{4}$ and tenths.</p> <p>Know decimal notation for tenths and hundredths in context. Know the value of each digit in a decimal fraction.</p> <p>Choose and use appropriate number operations and ways of calculating to solve problems involving multiplication and division, including those that gave rise to remainders.</p> <p>Consolidate knowing by heart all addition and subtraction facts for each number to at least 20. Derive number pairs that total 100 and pairs of multiples of 50 that total 1000.</p> <p>Derive quickly addition doubles to 50+50 and multiples of 10 to 500+500.</p> <p>Use mental recall of 2,3,4,5 and 10X tables in solving whole-number problems involving multiplication and division, including those with remainders.</p> <p>Add and subtract mentally a 'near multiple of 10' to or from a 2-digit number.</p> <p>Find a small difference by counting up through the next multiple of 1000.</p> <p>Further develop mental strategies e.g. use known number facts and place value to add or subtract mentally, numbers with at least 2-digits. Partition into hundreds, tens and units.</p> <p>Use known number facts and place value to mentally: +/- single digit to/from 3 or 4-digit number; +/- pairs of 2-digit numbers and pairs of multiples of 100; +/- multiples of 10 to/from 2 or 3 digit numbers; +/- 3-digit numbers to/from multiples of 10, 100, 1000; x 2/3-digit numbers by 10 or 100; ÷ 4 digit multiple of 1000 by 10 or 100.</p>
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