

Number: Addition and Subtraction

Number Bonds and Written Methods

Year 1		Year 2	Year 3	Year 4	Year 5	Year 6
Progression of knowledge						
<p>-To know that a number can be partitioned into two parts.</p> <p>-To know what the addition symbol is (+)</p> <p>-To know what the equals symbol is (=)</p> <p>-To know that addition is commutative but subtraction is not.</p> <p>-To know number bonds to ten.</p> <p>-To know that when 0 is taken away the whole remains the same.</p> <p>-To know what the subtraction symbol is (-)</p> <p>-To know number bonds to 20.</p> <p>-To use knowledge of number bonds to 10 to find number bonds to 20.</p> <p>-read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</p>		<p>To know addition and subtraction facts within 20 and can identify related facts</p> <p>To know their multiples of ten within and up to 100</p> <p>To know what happens when we add and subtract 1 (the ones digit changes)</p> <p>To know what happens we have 10 more or 10 less (the tens column changes)</p> <p>-recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100</p>	<p>Use their knowledge of adding and subtracting ones to adding multiples of 100</p> <p>To know that when adding ones it can affect the ones column and the tens column.</p> <p>To know that we can only hold a single digit in each column, anything over must be exchanged.</p> <p>To know when to use 0 as a place holder.</p> <p>To know what happens to a 3 digit number when a multiple of 10 is subtracted or added.</p> <p>To know there are different methods for subtraction.</p> <p>To refer to near numbers to see whether an estimate is sensible.</p> <p>- add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction</p>	<p>To know how to add and subtract thousands</p> <p>To use their knowledge of the addition of three digit numbers to add two 4 digit numbers without an exchange</p> <p>To know how to add two four digit numbers with exchanges</p> <p>To know how to subtract 2 four digit numbers with and without an exchange.</p> <p>-add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate</p>	<p>Children know how to place more than 4 digits in a formal calculation correctly.</p> <p>Children know when an exchange is needed and when it isn't needed in a formal calculation.</p> <p>Children know what happens when 0 is a place holder</p> <p>Children know what approximate means.</p>	<p>Children consolidate their knowledge of column addition and subtraction.</p> <p>Children know the place value of each digit and how to set it out correctly.</p> <p>-add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)</p>
Autumn	Spring					



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represent and use number bonds and related subtraction facts within 10	represent and use number bonds and related subtraction facts within 20					
Progression of skills						
<p>-understand the part whole model.</p> <p>-use the addition symbol and equal symbol to create number sentences within 10 and then within 20.</p> <p>-explore how many ways a number can be partitioned and use a variety of representations.</p> <p>explore numbers bonds to ten working systematically.</p> <p>Children can solve missing number problems</p> <p>Children can take away</p> <p>Children can find the difference</p> <p>Children can add by counting on</p> <p>Children can find fact families for addition and subtraction</p> <p>Children can count backwards to subtract</p> <p>Children can add numbers within 20.</p>	<p>-Compare number sentences within 20 to find missing calculations.</p> <p>-Explore mathematical relationships and spot patterns</p> <p>Compare calculations using $<$ $>$ and $=$</p> <p>Understand calculations with similar digits for both subtraction and addition eg: $2 + 5 = 7$ so 20 and $50 = 70$</p> <p>Add and subtract tens from a given number within 100 and can see what happens.</p> <p>Add 1 digit to 2 digits.</p> <p>Subtract 1 digit from 2 digits.</p> <p>Add 2 digit numbers including with an exchange.</p> <p>Subtract 2 digit numbers by 2 digit numbers including with an exchange.</p> <p>Find missing number bond to 100.</p>	<p>-Add and subtract ones from a 3 digit number with and without an exchange.</p> <p>-Add multiples of 10 to a 3 digit number with and without an exchange.</p> <p>-Add and subtract 100s</p> <p>-Spot patterns between calculations</p> <p>-Add and subtract 2 and 3 digit numbers with exchanges.</p> <p>-Add and subtract three digit numbers with and without an exchange.</p>	<p>Add and subtract thousands</p> <p>Add two 4 digit numbers with one exchange.</p> <p>Compare exchanges that occur in different place value columns.</p> <p>Explore multiple exchanges within an addition.</p> <p>Using concrete resources, children understand why exchanges happen.</p> <p>Subtract 4 digit numbers from 4 digit numbers using the column method of subtraction with no exchange</p> <p>Subtract 4 digit numbers from 4 digit numbers using the column method of subtraction with one exchange</p> <p>Explore column subtraction with more than one exchange.</p> <p>Subtract by finding the</p>	<p>Children can add more than two four digit numbers using formal addition.</p> <p>Children subtract numbers with more than four digits.</p> <p>Children can answers multi step addition and subtraction problems.</p>	<p>Children can identify whether the column method is the most appropriate method to use.</p> <p>Children use their skills to solve multi step problems in a range of contexts.</p>	



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Children can subtract numbers within 20.	Add three one digit numbers.		most efficient method.		
Children can subtract within 20 and cross ten			Compare the most efficient method and identify whether this is partitioning, take away or find the difference.		

Key Representations

-Part whole model -Double sided counters and tens frames and dot patterns. -Cubes. -Rekenreks -Number line	-Tens frames, counters, cubes and bar models - Rekenreks, -part whole model. Number line	Counters, tens frames, rekenreks Base ten (key representation in many steps) Place value chart Part whole model Number lines (step 9) set concrete resources out in a methodical way. Hundred squares and number tracks	-Base ten, place value counters, double sided counters, number lines, part whole models and bar models. -Place value chart –place 3 digit numbers into a place value chart to add and subtract. -Base ten and place value counters used in a place value chart alongside the written calculation. -Part whole and bar model (inverse operations step) -Number lines -Bar model for problem solving	Place value counters and Place value charts Base ten Number lines Part whole models and bar models	Place value counters Place value charts Bar models and part whole models (inverse operations) Bar models – problems solving, comparing calculations Number lines & bar models (finding missing numbers step 8)	Place Value charts Place Value Counters Gattegno Charts
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Mental Calculations

add and subtract one-digit and two-digit numbers to 20, including zero	add and subtract numbers using concrete objects, pictorial representations, and mentally, including: * a two-digit number and	add and subtract numbers mentally, including: * a three-digit number and ones * a three-digit number and		add and subtract numbers mentally with increasingly large numbers	perform mental calculations, including with mixed operations and large numbers
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	<ul style="list-style-type: none"> * ones * a two-digit number and tens * two two-digit numbers * adding three one-digit numbers 	<ul style="list-style-type: none"> * tens * a three-digit number and hundreds 			
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Inverse Operations, Estimating and Checking Answers (Skill)

	recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	estimate the answer to a calculation and use inverse operations to check answers	estimate and use inverse operations to check answers to a calculation	<p>Children can estimate answers to problems.</p> <p>Children can check their answers using the inverse.</p> <p>use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy</p>	use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.
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Problem Solving (Skill)

solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$	<p>solve problems with addition and subtraction:</p> <ul style="list-style-type: none"> * using concrete objects and pictorial representations, including those involving numbers, quantities and measures <p>applying their increasing knowledge of mental and written methods</p>	solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
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Key Vocabulary

Addition, add, more, and, make, plus, sum, total, partition, part-whole model, part, whole, commutative, altogether, double, near double, half, halve, one more, two more, ten more, subtract, take away, left, left over, gone, one less, two less, ten	Addition, add, more, and, make, plus, sum, total, partition, part-whole model, part, whole, commutative, altogether, double, near double, half, halve, one more, two more, ten more, subtract, take away, left, left over, gone, one less, two less, ten	Exchange, inverse, patterns, twenty first, twenty second... < and > =	Multiples of 100, place holder, sum of, regrouping, near numbers, estimate	4 digit numbers, inverse	Approximate, multi-step problem,
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less, fewer than, difference, number bonds, missing numbers.	less, fewer than, difference, number bonds, missing numbers.				
Ready to Progress					
<p>1NF-1 Develop fluency in addition and subtraction facts within 10.</p> <p>1AS-2 Read, write and interpret equations containing addition (), subtraction () and equals () symbols, and relate additive expressions and equations to real-life contexts.</p>	<p>2NF-1 Secure fluency in addition and subtraction facts within 10, through continued practice.</p> <p>2AS-1 Add and subtract across 10, for example: $8 + 5 = 13$ $13 - 8 = 3$ etc</p> <p>2AS-2 Recognise the subtraction structure of 'difference' and answer questions of the form, "How many more...?".</p> <p>2AS-3 Add and subtract within 100 by applying related one digit addition and subtraction facts: add and subtract only ones or only tens to/from a two-digit number.</p> <p>2AS-4 Add and subtract within 100 by applying related one digit addition and subtraction facts: add and subtract any 2 two digit numbers.</p>	<p>3NF-1 Secure fluency in addition and subtraction facts that bridge 10, through continued practice.</p> <p>3AS-1 Calculate complements to 100, for example: $46 + ? = 100$</p> <p>3AS-2 Add and subtract up to three-digit numbers using columnar methods.</p> <p>3AS-3 Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction, and how both relate to the part-part-whole structure. Understand and use the commutative property of addition, and understand the related property for subtraction.</p>			<p>6AS/MD-1 Understand that 2 numbers can be related additively or multiplicatively and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).</p> <p>6AS/MD-1 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.</p>

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