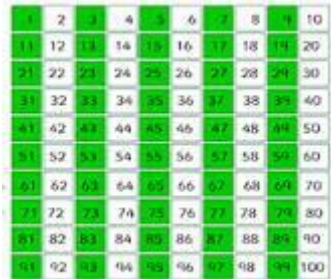


ADDITION AND SUBTRACTION SEQUENTIAL LEARNING OSMOTHERLEY CP

Highlighted= 2020 Maths guidance ready-to-progress criteria

Year group	sequence	methods
FOUNDATION	<ul style="list-style-type: none">*begin to organise and sort into categories and groups*explore change within 5*know number bonds to 5*investigate addition to ten *add and subtract by counting on and back	<ul style="list-style-type: none">*using wide variety of practical objects *one more moving to one less *combining two groups to find the whole*making number bonds to ten using ten frame*making number bonds to ten using part-whole model

ONE	<p><i>*read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs and relate to real life contexts</i></p> <p><i>*compose numbers to 10 from 2 parts and partition number to ten into parts including odd and even</i></p> <p>*represent and use number bonds and related subtraction facts within 20</p> <p>*add and subtract one-digit and two-digit numbers to 20, including 0</p> <p>*solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = ? - 9$</p>	<p>Pupils memorise and reason with number bonds to 10 and 20 in several forms (for example, $9 + 7 = 16$; $16 - 7 = 9$; $7 = 16 - 9$). They should realise the effect of adding or subtracting 0. This establishes addition and subtraction as related operations.</p> <p>use numicon to show bonds</p> <p>Pupils combine and increase numbers, counting forwards and backwards.</p> <p>They discuss and solve problems in familiar practical contexts, including using quantities. Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly</p>
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		<p>* The hundred square can be used to support additive patterns in number as well as a tool for counting on</p> 
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TWO	<p>*add and subtract across ten</p> <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 	
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- applying their increasing knowledge of mental and written methods

*recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100

***recognise vocabulary: difference as a subtraction structure and answer “How many more?” questions**

***add and subtract numbers using concrete objects, pictorial representations, and mentally, including:**

- **a two-digit number and ones**
- **a two-digit number and tens**
- **2 two-digit numbers**
- **adding 3 one-digit numbers**

*show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot

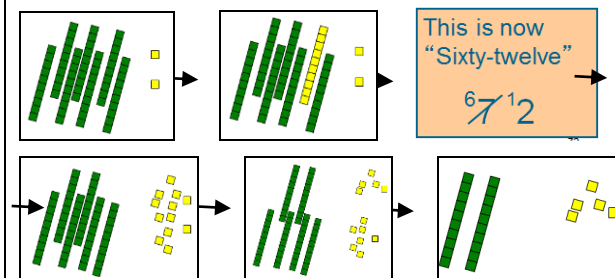
*recognise and use the inverse relationship between addition and subtraction and use this to

Children should use a range of practical apparatus (straws, base ten apparatus, place value cards, place value counters) to support partitioning for subtraction progressing through gradually more abstract representations.

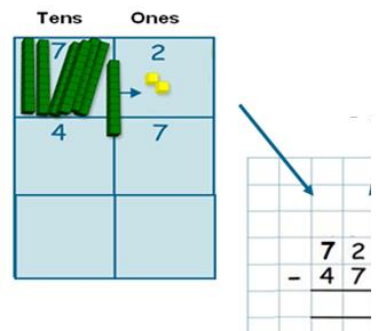
Straws, bundled into 10s and singularly allow children to see create and count the ‘10’ within the bundle.

This then progresses to the use of base ten where 10s are clearly marked in ones but cannot be separated in the same way

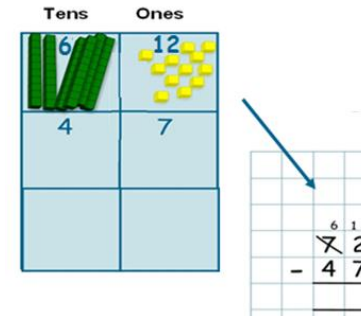
e.g. $72 - 47 =$



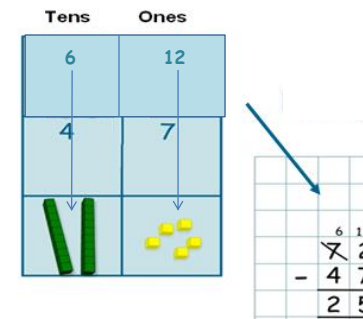
Recording addition and subtraction in columns supports place value and prepares for formal written methods with larger numbers

	check calculations and solve missing number problems	
THREE	<p>*calculate complements to 100</p> <p>*add and subtract numbers mentally, including:</p> <ul style="list-style-type: none"> ○ a three-digit number and 1s ○ a three-digit number and 10s ○ a three-digit number and 100s <p>*add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction</p> <p>*manipulate the additive relationship and the inverse relationship as part-part-whole structure</p> <p>*estimate the answer to a calculation and use inverse operations to check answers</p> <p>*solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction</p>	<p>Pupils practise solving varied addition and subtraction questions. For mental calculations with two-digit numbers, the answers could exceed 100.</p> <p>Pupils use their understanding of place value and partitioning, and practise using columnar addition and subtraction with increasingly large numbers up to 3 digits to become fluent (supported by base ten equipment where helpful).</p> <p>A. Using multibase alongside formal calculations</p> <p>72 – 47</p> 

*** understand and use commutative property of addition and understand related property for subtraction**



7 ones and then 4 tens are removed, leaving 25. The 25 can be dragged to the bottom to model the recording used in the written algorithm



When the tens barrier is crossed 'exchange' or 're-group' takes place.

B.formal methods (Children should continue to use practical equipment to support conceptual understanding until they are confident without it.)

		<div><div><div>789</div><div><div><div>16142</div><div>+</div></div><div><div>1431</div></div></div></div></div>	<div><div>874 – 523 becomes</div><div><div><div>874</div><div>– 523</div></div><div><div>351</div></div></div><div>Answer: 351</div></div>	<div><div>932 – 457 becomes</div><div><div><div>932</div><div>– 457</div></div><div><div>475</div></div></div><div>Answer: 475</div></div>
FOUR	<div><div><div>*add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate</div><div>*estimate and use inverse operations to check answers to a calculation</div><div>*solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why</div></div></div>	<div><div>Pupils continue to practise both mental methods and columnar addition and subtraction with increasingly large numbers to aid fluency.</div></div>		

FIVE	<p>*add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)</p> <p>*add and subtract numbers mentally with increasingly large numbers</p> <p>*use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy</p> <p>*solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</p>	<p>Pupils practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency</p> <p>They practise mental calculations with increasingly large numbers to aid fluency (for example, $12,462 - 2,300 = 10,162$).</p>
SIX	<p>*solve addition and subtraction multi-step problems in contexts (including decimals and much larger numbers) deciding which operations and methods to use and why</p> <p><i>understanding that 2 numbers can be related additively or multiplicatively, and quantify</i></p>	<p>BODMAS</p> <p>B brackets first</p> <p>O orders i.e. powers,squares,roots</p> <p>DM division/multip. Left to right</p> <p>AS addition/subtraction left to right</p>

***additive and multiplicative relationships
(multiplicative relationships restricted to
multiplication by a whole number).***

*use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

*use their knowledge of the order of operations to carry out calculations involving the 4 operations (BODMAS) and identify how the position of brackets can affect the answer

****use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding***

****Solve problems involving ratio relationships.***

****solve problems using combinations of the 4 processes with 2 unknowns***