Nursery Hill Primary School, Ansley Common, Nuneaton

Calculation Policy Year 2

Written September 2018

Adopted October 2018
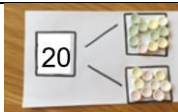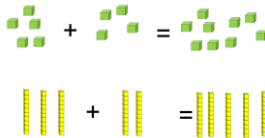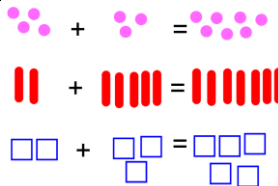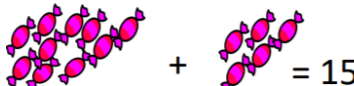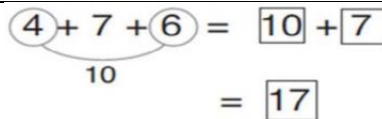
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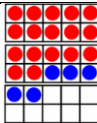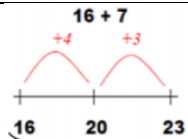
Children are introduced to the processes of calculation through practical, oral and mental activities. As children begin to understand the underlying ideas they develop ways of recording to support their thinking and calculation methods, use particular methods that apply to special cases, and learn to interpret and use the signs and symbols involved. As children's mental methods are strengthened and refined, so too are their informal written methods. These methods become more efficient and succinct and lead to efficient written methods that can be used more generally. By the end of Year 6 children are equipped with mental, written and calculator methods that they understand and can use correctly. When faced with a calculation, children are able to decide which method is most appropriate and have strategies to check its accuracy. At whatever stage in their learning, and whatever method is being used, it must still be underpinned by a secure and appropriate knowledge of number facts, along with those mental skills that are needed to carry out the process and judge if it was successful. In summary, we are aiming for children who;
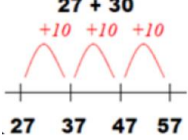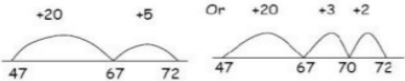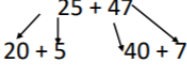
- ✓ have a secure knowledge of number facts and a good understanding of the four operations;
- ✓ have a secure understanding of place value to support with mental and written calculations;
- ✓ are able to use this knowledge and understanding to carry out calculations mentally and to apply general strategies when using one-digit and two digit numbers and particular strategies to special cases involving bigger numbers;
- ✓ make use of diagrams and informal notes to help record steps and part answers when using mental methods that generate more information than can be kept in their heads;
- ✓ have an efficient, reliable, method of calculation for each operation that children can apply with confidence when undertaking calculations, either written or mental;
- ✓ use a calculator effectively, using their mental skills to monitor the process, check the steps involved and decide if the numbers displayed make sense.

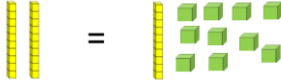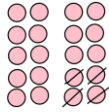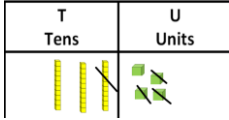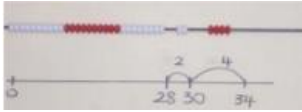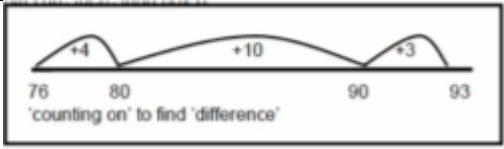This policy outlines the routes through calculation within each year group to support the development of all 4 operations. Support and guidance for this policy has been taken from the White Rose Maths Calculation Policy as well as additional materials.

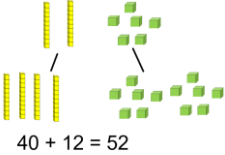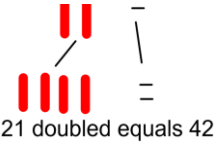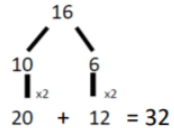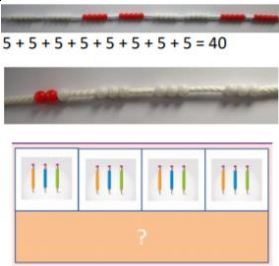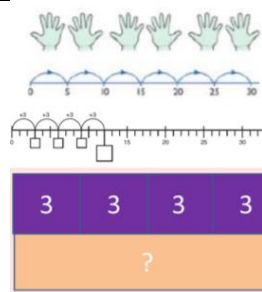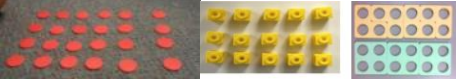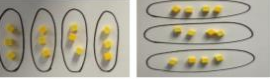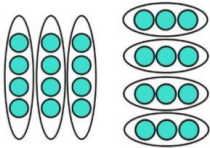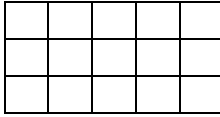|			
Addition - Year 2			
Objective	**Concrete**	**Pictorial**	**Abstract**
Adding multiples of ten	20 + 30 = 50 Model using dienes or bead strings.	3 tens + 4 tens = 7 tens 30 + 40 = 70 Use representations for dienes	40 + 50 = 90 60 = 40 + 20 80 = 40 + ?
Use known number facts (part, part, whole)	20 Children explore ways to make numbers within 20.	20 ? + ? = 20 20 - ? = ? + ? = 20 20 - ? =	□ + 1 = 16 16 - 1 = 1 + □ = 16 16 - □ = 1
Using known number facts	+ = + =	+ = + = + = Children draw representations for H, T, U	3 + 4 = 7 Leads to 30 + 40 = 70 Leads to 300 + 400 = 700
Bar Model – supporting problem solving	3 + 4 = 7	7 + 3 = 10		?	
25	28	 25 + 28 = ?
Add 3 one digit numbers	Combine to make 10 first if possible or bridge 10 and add the third digit.	+ + Regroup and draw representation. + = 15	4 + 7 + 6 = 10 + 7 10 = 17 Combine two numbers that make 10 if possible then add the third digit.
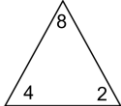
Add a 2 digit number and ones	 Use ten frames to make 'magic ten' then explore patterns e.g 17+5=22, 27+5=32	 16 + 7 +4 +3 16 20 23 Make links to jumps to the magic ten rather than counting in ones.	18 + 6 = 24 Explore related facts 18 + 6 = 24 6 + 18 = 24 24 – 6 = 18 24 – 18 = 6 24 / 6 / 18
Add a 2 digit number and tens	 Explore that the ones do not change when adding multiples of ten.	 27 + 30 +10 +10 +10 27 37 47 57	47 + 10 = 57 47 + 30 = 77 38 + ? = 58
Add 2 digit numbers to 2 digit numbers	 Model using dienes or place value counters. Add the units first and then the tens.	 +20 +5 Or +20 +3 +2 47 67 72 47 67 70 72 Use a number line to add the tens and then ones separately.	25 + 47 20 + 5 40 + 7 20 + 40 = 60 5 + 7 = 12 60 + 12 = 72
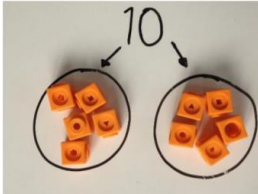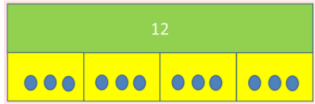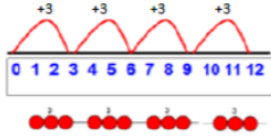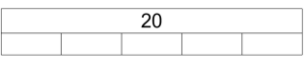
Subtraction - Year 2			
Objective	**Concrete**	**Pictorial**	**Abstract**
Regroup a ten into ten ones	Use dienes to show how to change a ten into ones. 'Take and make'	20 – 4 = 16 Children to represent numbers using jottings.	20 – 4 = 16
Partitioning to subtract without regrouping	34 – 13 = 21 Use dienes to show how to represent a number.	34 – 13 = 21 Count back in ones using a number line.	43 – 12 = 31
Make ten strategy

Progression should be crossing one ten, crossing more than one ten then crossing the hundreds | Use bead strings to count to the next ten and then 'jump' the rest. | Use a number line to count onto the next ten and then the rest. | 93 – 76 = 17 |

Multiplication - Year 2

Objective	Concrete	Pictorial	Abstract
Doubling	 40 + 12 = 52 Model doubling using dienes.	Draw pictures to show how to double numbers. 21 doubled equals 42	 16 10 6 x2 x2 20 + 12 = 32 Partition each digit and double each. Recombine the answers.
Counting in multiples of 2, 3, 4, 5, 10 from 0 (repeated addition)	 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 40 Count the groups as children are skip counting. Children may use their fingers as they are skip counting. Use bar models.	 3 3 3 3 ? Number lines, counting sticks and bar models should be used to show representation of counting in multiples.	Count in multiples aloud. Write sequences with multiples of numbers 2, 4, 6, 8, 10 3, 6, 9, 12, 15 5, 10, 15, 20, 25, 4 x 3 = ?
Multiplication is commutative	Create arrays using counters. Pupils should understand that an array can represent different equations and that multiplication is commutative - the order doesn't affect the answer	 Use representations of arrays to show different calculations and explore commutativity.	12 = 3 x 4 12 = 4 x 3 Use the array to write multiplication sentences. 5 + 5 + 5 = 15 3 + 3 + 3 + 3 + 3 = 15 5 x 3 = 15 3 x 5 = 15

| Using the inverse (taught alongside division so children can see the link) | Use cubes to visualise the numbers. | Use triangles to support understanding | 2 x 4 = 8
 4 x 2 = 8
 8 ÷ 2 = 4
 8 ÷ 4 = 2
 8 = 4 x 2
 8 = 2 x 4
 Etc. |

Division - Year 2			
Objective	**Concrete**	**Pictorial**	**Abstract**
Division as sharing	 I have 10 cubes. Can you split them into 2 equal groups?	$8 \div 2 = 4$ 8 shared between 2 is 4 Children use bar modelling to show and support understanding. E.g $12 \div 4 = 3$	$12 \div 3 = 4$
Division as grouping	 Divide quantities into groups. 	 Use number lines for grouping. Use the bar model to support. 12 is the whole and split the bar into the number needed. $20 \div 5 = ?$ $5 \times ? = 20$	$28 \div 7 = 4$ Divide 28 into groups of 7. How many are in each group?