



LARKS HILL J&I SCHOOL

Calculations Policy

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Calculations Policy

Introduction

At Larks Hill Junior and Infant School we want children to choose appropriate methods of calculation according to personal needs and the needs of the problem to be solved.

There are many variations on methods that the children could be taught but the reality is that for many children too much choice can mean no choice. Methods are never consolidated enough to become a source of confidence and an effective tool in problem solving.

Children need the opportunity to develop safe methods, early in their careers, that they can use and adapt in increasingly complex situations. The 'basics' of mathematics is the ability to solve problems, not the ability to perform abstract algorithms. Mathematics can only be used effectively when the user understands the tool.

This calculation policy clarifies the methods that will be taught in class lessons in Larks Hill Junior and Infant School. Every teacher can be confident that the hard work that goes into teaching the children to calculate this year will be consolidated and extended next year.

This policy reflects the consensus of opinion of the whole teaching staff and has been drawn up as a result of staff discussion.

The implementation of this policy is the responsibility of the Headteacher and all the teaching staff. All children are taught Mathematics by their class teacher with the support of class teachers.

Whole School Calculation Strategies

Calculations should always be in context. Start with a problem and unravel the calculation step by step.

Try to develop the ethos - 'we do this together'. The teacher will demonstrate, and then let the children do it with her/him.

Use the mathematical language suitable for the calculation and be consistent. Refer to the National Curriculum for the vocabulary relevant to the topics and the year group being taught.

The National Curriculum

The National Curriculum 2014 sets out the following expectations for calculations in addition, subtraction, multiplication and addition for each year group.

Year group	Addition and subtraction	Multiplication and division
1	<p>read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</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</p> $7 = ? - 9$	<p>solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher</p>
2	<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 ○ applying their increasing knowledge of mental and written methods <p>recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100</p> <p>add and subtract numbers using concrete objects, pictorial representations, and mentally, including:</p> <ul style="list-style-type: none"> • a two-digit number and 1s • a two-digit number and 10s • 2 two-digit numbers • adding 3 one-digit numbers <p>show that addition of 2 numbers can</p>	<p>recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers</p> <p>calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs</p> <p>show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot</p> <p>solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts</p>

	<p>be done in any order (commutative) and subtraction of 1 number from another cannot</p> <p>recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems</p>	
3	<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>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>recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables</p> <p>write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods</p> <p>solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects</p>
4	<p>add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate</p> <p>estimate and use inverse operations to check answers to a calculation</p> <p>solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why</p>	<p>recall multiplication and division facts for multiplication tables up to 12×12</p> <p>use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers</p> <p>recognise and use factor pairs and commutativity in mental calculations</p> <p>multiply two-digit and three-digit numbers by a one-digit number using formal written layout</p> <p>solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n</p>

		objects are connected to m objects
5	<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>identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers</p> <p>know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers</p> <p>establish whether a number up to 100 is prime and recall prime numbers up to 19</p> <p>multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers</p> <p>multiply and divide numbers mentally, drawing upon known facts</p> <p>divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context</p> <p>multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000</p> <p>recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)</p> <p>solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes</p> <p>solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign</p> <p>solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates</p>

6	<p>multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication</p> <p>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</p> <p>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</p> <p>perform mental calculations, including with mixed operations and large numbers</p> <p>identify common factors, common multiples and prime numbers</p> <p>use their knowledge of the order of operations to carry out calculations involving the 4 operations</p> <p>solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</p> <p>solve problems involving addition, subtraction, multiplication and division</p> <p>use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy</p>	

Calculations within the Pontefract Academies Trust

In the summer term of 2014, the maths coordinators of the primary schools and the heads of maths of the secondary schools within the Trust met to agree a calculation policy for the whole Trust. This would mean that the same methods would be taught in all the schools within the Trust making the transition to secondary schools easier and also helping to raise standards.

Calculations at Larks Hill School

We have adopted the policy developed by the Trust completely. In the early years at Larks Hill, children will use practical apparatus to help perform calculations. In Years 1 and 2 they will progress to using number lines when calculating and, by the end of Year 2, many children will have started to use more formal written methods. In Key Stage 2, the children will mostly use formal written methods to solve increasingly difficult problems. This policy will be reviewed at the end of the academic year 2016/17.