



Kirton Lindsey Primary School

Mathematics Calculation Policy



This policy is based on national expectations as outlined in the 2014 National curriculum. Year groups are included but teachers will need to use a degree of flexibility in deciding appropriate methods for different groups of children.

To be used in conjunction with all other progression documents linking to the programmes of study, notably fractions, reasoning and algebra.

Introduction:

The 2014 National Curriculum provides a structured and systematic approach to the teaching of calculation. The aim is for mental calculations and written procedures to be performed efficiently, fluently, accurately with understanding. Procedures and understanding are to be developed in tandem. End of key stage expectations are explicit in the programme of study.

At Kirton Lindsey Primary School, we have a consistent approach to the teaching of written calculation methods in order to ensure continuity and progression across the school.

Age related expectations:

This calculation policy is organised according to age appropriate expectations as set out in the National Curriculum 2014, **however it is vital that pupils are taught according to the stage that they are currently working at**, being moved onto the next level as soon as they are ready, or working at a lower stage until they are secure enough to move on.

Providing a context for calculation:

It is important that any type of calculation is given a real life context or problem solving approach to help build children's understanding of the purpose of calculation, and to help them recognise when to use certain operations and methods. It is also important for children to be confident to use mental and written strategies to explain their thinking. This must be a priority within calculation lessons. Written methods need to be viewed as tools to enable children to solve problems and record their thinking in an organised way.

Aims:

Children should be able to use an efficient method, mental or written appropriate to the given task, with understanding. Children are encouraged to use a range of models and images, such as arrays, the bar method, number lines to ensure they understand the final compact method they are building up to. By the end of year 6, children will have been taught, and be secure with, a compact standard method for each operation.

To develop efficient written calculation strategies children need:

- Secure mental methods which are developed from early years
- A solid understanding of the number system
- Practical hands on experience including a range of manipulatives incorporating visual models and images including number lines and arrays through a whole school Conceptual, Practical and Abstract (CPA) approach to planning and teaching calculation
- Experience of expanded methods to develop understanding and avoid rote learning
- Secure understanding of each stage before moving onto the next.

Before carrying out a calculation, children will be encouraged to consider:

- Can I do it in my head? (using rounding, adjustment)
- The size of an approximate answer (estimation)
- Could I use jottings to keep track of the calculation?
- Which resources to use to support their calculation.

When are children ready for written calculations?

Addition and subtraction:

- Do they know addition and subtraction facts to 20?
- Do they understand place value and can they partition numbers?
- Can they add three single digit numbers mentally?
- Can they add and subtract any pair of two digit numbers mentally?
- Can they explain their mental strategies orally and record them using informal jottings?

Multiplication and Division:

- Do they know the 2, 3,4,5,6 and 10 times tables and corresponding division facts?
- Do they know the result of multiplying by 1 and 0?
- Do they understand 0 as a place holder?
- Can they multiply two and three digit numbers by 10 and 100?
- Can they double and halve two digit numbers mentally?
- Can they use multiplication and division facts they know to derive mentally other multiplication and division facts that they do not know?
- Can they explain their mental strategies orally and record them using informal jottings?

These lists are not exhaustive but are a guide for the teacher as they structure the move from informal to formal methods of calculation. It is important that children's mental methods of calculation are practiced and secured alongside their learning and use of an efficient written method for each operation. Additionally key number skills should be continually revisited to ensure that every child's understanding of concepts in number supports his/her development in calculation.

A pathway to teaching calculation methods:

Expanded methods should be viewed as steps towards a standard method and not as methods in themselves.

Before beginning to record in a more refined written format children must have had significant practical work reinforced with appropriate manipulative, models and images.

Teachers will guide pupils to refine their written methods of recording by modelling and asking questions such as "What is the same? What's different?"

Learning will be planned to ensure pupil are encouraged to use and apply what they have learnt to problem solving tasks.

As children move along the pathway it is vital that they develop fluency (practice, reinforce, consolidate), reason mathematically (predicting relationships and generalisations, develop an argument) , solve problems by using and applying it to mathematical learning and NOT simply move onto the next step.

Points to note:

- To be successful in learning to calculate children must be able to; count reliably forwards and backwards, recognise individual digits, know what each digit represents, know that digits combine to make numbers and have some understanding of the concept of zero.
- The correct terminology should be used when referring to the value of digits to support the children's understanding of place value. e.g. $68 + 47$ should be read 'sixty add forty' not 'six add four'
- Teachers should refer to the programme of study for key vocabulary for each year group.

Kirton Lindsey Primary School has a Maths Specialist Teacher who supports staff by delivering CPD using the MAST principles and is available for support where needed.

- In response to the announcement in October 2017 that in 2019 year 4 children will take a times tables test an appendix has been added to the calculation policy showing the programme used to teach times tables to ensure the children are ready to complete the test by the Summer term of Year

