

North Kidlington School



Policy for the Teaching and Learning of Mathematics

This policy should be read in conjunction with the attached Calculation Policy which details the strategies and formats used for teaching written methods for each of the four main mathematical operations.

NORTH KIDLINGTON SCHOOL

MATHEMATICS

A POLICY STATEMENT

Aim:

- To develop children at North Kidlington School as mathematical thinkers who can ask questions, imagine solutions, generate ideas and approach mathematical problems with confidence.

Objectives:

In line with the revised National Curriculum aims (2014), the teaching of mathematics at North Kidlington School seeks to help children to:

- *'become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.*
- ***reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language*
- ***solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.'* (DFE 2014)

Equal Opportunities

In line with our school policy, we aim to give all children equal opportunities in the mathematics curriculum regardless of gender, cultural or religious background or disability.

Planning for Mathematics Learning

At North Kidlington School it is recognised that the effective choice of mathematical tasks is crucial in order to develop real and lasting mathematical understanding. Tasks or problems set in lessons are a starting point for learning, teachers and support staff appreciate that it is the quality of questioning, discussion

and careful observations of children engaged in the tasks that create valuable opportunities for assessing understanding and mastery of mathematical concepts.

Planning for mathematics lessons therefore aims to ensure a range of experiences which allow children to make connections between aspects of mathematics; every effort is made to regularly provide ‘rich tasks’ which have a ‘low threshold’ but ‘high ceiling’ and which can be accessed by a range of pupils, whilst providing adequate challenge for those pupils making swift progress.

Mathematics is planned collaboratively between class teachers in each department, Key Stage 1, Lower key stage 2 and upper key stage 2.

There are 3 types of planning used for mathematics at North Kidlington School as follows:

1. Long term plans (LTP): show the mathematics to be taught across the full school year. LTPs indicate the specific allocation of time for each unit to be taught and allow opportunities to revisit themes several times throughout the year. The LTP also ensures coverage of the national curriculum requirements.

2. Medium term plans (MTP): Show the breakdown of themes into specific objectives for each term- autumn, spring and summer. The MTPs also shows the division of objectives between the 2 year groups in each department; the objectives for the older of the 2 age groups are shown in a different colour, this ensures clarity for class teachers when planning for mixed age classes.

3. Short term plans (weekly plans): As each unit is taught teachers write the weekly plan based upon the objectives identified in the medium term plans. Individual class teachers also ensure that weekly planning is adapted to the specific needs of their particular class, groups or individual pupils.

In order to ensure continuity and progression in planning of mathematics lessons, all teachers use ‘Abacus Active Learn’, which provides structured planning, interactive teaching tools, pupil books and online resources. However, class teachers also use a range of other varied resources as relevant to the learning objectives.

Differentiation

We endeavour to encourage all children to reach their full potential by offering a suitable range of activities in the classroom which address the needs of individuals, or, where appropriate, groups of children. Our subscription to 'Abacus Active Learn' also enables teachers to access both plans and a broad range of teaching materials for all age groups across Key Stages 1 and 2; if a child is working above or below their age related expectations, there are appropriate materials readily available to teachers at the planning stage.

In addition to differentiated class work, more able pupils in key stage 2 also have the opportunity to participate in a 'booster group' which provides further breadth and challenge with extension work suited to the pupil's abilities. For children experiencing difficulties there are a range of intervention groups that are regularly reviewed by the special needs and mathematics co-ordinators in conjunction with information from class teachers.

Assessment for Learning

Ongoing (formative) assessment is therefore carried out in a range of ways e.g. by observing children, questioning, group or 1:1 discussion. This is in addition to assessment of written work which, in line with our marking policy (see attached appendix 2) will clearly identify both children's success and areas of weakness.

Teachers give verbal feedback to individuals which may on occasions be the most appropriate form of feedback; this is noted by teachers as '*verbal feedback given*' in the child's book. Although children should be praised for their efforts and meeting their learning objectives, we also believe both verbal and written feedback should provide opportunities to model methods where difficulties occur and to clearly identify 'next steps' for learning as detailed further in the Marking Policy.

Each department collects summative assessment information for mathematics 3 times per year (November, February and June) as part of the school system for tracking individual, class/ cohort and whole school progress. (See Assessment policy for further information).

Structure of mathematics lessons

Class teachers decide upon the most appropriate organisation of each lesson according to the objectives of their lesson and assessments of children's needs from previous lessons. However, there are some common features of mathematics teaching at North Kidlington across all age groups:

Aims and objectives

In each maths lesson the teacher will share the objective for the lesson with the children; this may be verbal, and /or written on the board. As children move through the school they become familiar with the term 'WALT' (We are learning to) which helps clarify learning and promotes the opportunity to reflect at the end of the lesson on whether each child feels they have achieved the 'WALT'.

Talk to learn

The expectations of the revised National Curriculum also emphasise the need for quality of mathematical language in order to develop mathematical thinking and communication skills:

'The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof. They must be assisted in making their thinking clear to themselves as well as others and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.' (DFE 2014)

A fundamental aspect of the teaching and learning policy at North Kidlington School highlights the importance of the ratio of teacher to pupil talk; the balance of adult to pupil talk is aimed to be in the region of 25% adult to 75% pupil discussion. It is recognised that children learn most effectively when they are actively engaged, e.g. by asking questions, sharing ideas and developing solutions to problems.

Children in all classes have opportunities to work individually, in pairs or groups and as a class. Mathematical experiences will include questioning by the teacher, discussion between the teacher and pupils and between pupils themselves. All teachers across the school expect children to show their engagement in their own learning by reflecting upon their progress in lessons and considering their own 'next steps' or short term targets.

Practical / Concrete resources

Class teachers are committed to promoting mathematics as a creative and real subject which can be adapted to problems in everyday life, it is therefore recognised that practical/ concrete resources such as Dienes, Numicon and Cuisenaire rods have a valuable role to play in every age group from Foundation stage to year 6.

In the earlier stages of learning these structured resources allow children to develop deep understanding of mathematical concepts through opportunities to manipulate real items and to see ideas modelled either by the teacher or their peers. Once children become competent in their understanding the resources will take on a different role, for example by providing the chance for children to show ‘proof’ of a mathematical conjecture, or to assist them in their explanations to others of their solutions to problems.

Calculation

Whilst children are encouraged to be creative as mathematicians and develop their own strategies to tackle problems, it is also important to be able to recognise the most efficient method of calculation, whether it be using pencil and paper, calculator, or a mental strategy. To this end, class teachers have agreed the most appropriate methods and resources to use at each stage of learning. This is specified in a whole school ‘Calculation Policy’ (updated autumn 2016) in line with the requirements of the new 2014 Mathematics Curriculum. It has also been reviewed by the co-ordinator to ensure consistency in teaching across the school and with the methods taught through the ‘Active Learn’ teaching materials (see appendix I).

Representations of Calculations

All classrooms from FSU to year 6 are equipped with practical resources such as Numicon or Dienes structured apparatus, to provide models and images which support children’s conceptual understanding of mathematics.

When children are ready the teacher may introduce a more abstract model or image such as empty number lines, to support their mental and informal written methods of calculation. Eventually children will feel confident to use jottings/ written recording for a large amount of the time but are also encouraged to access practical resources at any stage, whether to support a difficulty or to help test an idea.

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. At whatever stage in their learning, children's strategies 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.

Special Educational Needs

Teachers planning for Mathematics includes activities relevant to children with special educational needs. At North Kidlington School we also provide regular targeted support for children experiencing difficulties in their learning of Mathematics; this may include extra adult help either in the classroom or as part of an intervention such as '*First Class @Number*'. The decisions regarding pupil participation in these support groups are usually made collectively by the class teacher, SENCO and Head teacher at pupil progress meetings but class teachers may also report a concern re pupil progress to the SENCO or Maths Co-ordinator between meetings.

Mathletics and links to Computing

In order to capitalise upon the use of the internet and developing technologies, we subscribe to 'Mathletics', an internet based teaching programme which children use to practise skills and to compete in online mathematical challenges.

Children use 'Mathletics' both at home and at school, which we believe also helps to involve parents in their child's learning as they can see the types of tasks/ level of work expected of their child. We recommend 2-3 sessions of 15-20 minutes per week at home and this is supplemented at school by regular class sessions in the computer suite as well as 'inter-class' or school wide competitions to encourage regular practise of Mathematics in an enjoyable and interactive form.

Teachers timetable the use of class computers/laptops during registration for specific pupils to use 'Mathletics' and the computer room is open to key stage 2 children during breaks and lunchtimes. In order to ensure an equal opportunity for all, class teachers prioritise additional time for children with little access to computers at home.

In line with our computing policy, children will also use information technology to communicate their findings, control, explore and solve problems and collect and process data as appropriate. Teachers use appropriate software on the computer network, as well as other computing/ programming resources such as 'Scratch', 'Roamer' or LOGO which support mathematical understanding in aspects such as shape, direction and measures of turn/angles.

Monitoring

Class teachers are expected to save copies of all long term, medium term and weekly planning on the school's shared network, this ensures that it is possible to easily monitor plans for national curriculum coverage, progression and continuity across the school.

In addition, mathematics teaching is observed in every class by both the Mathematics Co-ordinator and separately by the Head teacher, or Deputy Head teacher, as part of performance management procedures.

Accountability

This policy, along with long term plans is available to parents, governors and outside agencies through publication on the school website.

Reporting

- Class teachers are responsible for keeping parents informed of targets and progress at parent/ teacher consultations and annually in a written report.
- Governors will be informed of progress through Head teachers and Co-ordinators reports to the Curriculum sub-committee or full Governing Body annually.

Reviewed: October 2016

Next Review: September 2018