St Nicholas Priory CEVA Primary School

Policy for Mathematics

Rationale

Mathematics is a beautiful subject which has its own unique place in the curriculum. It provides pupils with powerful ways to describe, analyse and change the world. Pupils can experience a sense of awe and wonder as they solve a problem for the first time, discover a more elegant solution and make links between different areas of mathematics.
Mathematics is the means of looking at the patterns that make up our world and the intricate and beautiful ways in which they are constructed and realised. The language of mathematics is international. The subject transcends cultural boundaries and its importance is universally recognised. Mathematics helps us to understand and change the world.

Pupils at St. Nicholas Priory study mathematics to become functioning adults who are able to think mathematically enabling them to use the four operations fluently, reason, solve problems and assess risk in a range of contexts.

"Good mathematics teaching is lively, engaging and involves a carefully planned blend of approaches that direct children's learning….the pitch and pace of the work is sensitive to the rate at which children learn while ensuring expectations are kept high and progress is made by all children" (The Primary National Strategy)

- ✓ We believe pupils who are functional in mathematics are able to participate in modern society having the tools to understand science, technology, engineering and economics.
- ✓ Pupils at our school study mathematics so that they can become fully participating citizens in society who are able to think mathematically, reason, solve problems and assess risk in a range of contexts.
- ✓ Good **learning** takes place when pupils are given opportunities to solve problems by developing their understanding and making links between different areas of mathematics and applying skills.
- ✓ Good **teaching** enables good learning to take place. It involves creating an appropriate environment in which pupils can respond to high levels of expectation and challenge.

'The teachers' job is to organise and provide the sorts of experiences which enable pupils to construct and develop their own understanding of mathematics, rather than simply communicate the ways in which they themselves understand the subject.'
(Non-Statutory Guidance, National Curriculum, 1989)

Vision
We believe the understanding of mathematical concepts has precedent over simply learning a series of algorithms. We believe that understanding of mathematical concepts is sequential and that pupils need to have a sound understanding of each stage before progressing to the next. Accelerating

progress at the expense of depth of understanding is not appropriate. The following points should be noted:

- ✓ There are no references to age in our Calculation Policy. Stage of mathematical development takes precedence over chronological age
- ✓ Whilst the national curriculum refers repeatedly to columnar addition, subtraction, multiplication and division all learners will be secure in their use of "informal methods" such as number lines and the grid method first and foremost. Only where learners have already been taught the "formal methods" set out in the national curriculum and when they can use them successfully should they be using them. In exceptional circumstances – such as where the learner is fluent at using informal methods should they be exposed to the formal methods as per the national curriculum. The thinking behind this is based on the belief that conceptual understanding is essential for learners to build on their experiences. Learning algorithms is NOT developing conceptual understanding

Mathematics in Practice: Overview

Pupils are provided with a variety of opportunities to develop and extend their mathematical skills in and across each phase of education.

- ✓ We teach mathematics every day
- ✓ Once pupils have read their teacher's marking and completed specified tasks asked of them the teacher provides teaching input based on the teacher's gap analysis. Areas for development will be chosen by the teacher that can be addressed quickly in a mini challenge format
- ✓ Following approximately 5 minutes teacher input pupils complete their preferred mini challenge which will be ONE calculation minimum (and no more than 3). The total time, including teacher input, will be about 10 minutes. Mini challenges are differentiated by cognitive demand
- ✓ The mini challenge consists of:
  Date
  Calculation
  Learning Objective
  See rubric in appendices, page 7
- ✓ The mini challenge should be completed as quickly as possible. It should be completed independently of an adult but learners can work together. It is *not* a test!
- ✓ The mini challenge as described above should be used in all lessons apart from the stand-alone problem solving lesson. In these lessons pupils solve a mathematical reasoning problem and are invited to share their response rather than receiving teacher input at the beginning. Examples are Peculiar- Obvious -Generally (POG), Always-Sometimes-Never and Odd One Out

- ✓ Regular counting should be an essential part of our practice. As such learners in all year groups should be confident at counting in a variety of ways. All learners must experience counting in a range of multiples as per the national curriculum although this does not have to be part of the maths lesson but may be done at any time in the day

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- ✓ Pupils should not do more than 5 calculations that are the similar in any one maths lesson
- ✓ Learners must know by heart number facts such as all times-tables up to 12 X 12, number facts about 20 and 100, factors, prime numbers, squared and cubed numbers as well as doubles and halves of numbers to 100
- ✓ Learners need to have ONE secure, efficient written method (informal or formal) for all of the operations but ideally can use a range of strategies (see Early Morning Work)
- ✓ Calculators will CONTINUE to be part of our practice despite the fact that a calculator paper no longer exists as part of the end of KS2 assessment. Calculators develop thinking skills and should not be simply used to check answers
- ✓ Learners should experience a problem solving opportunity which develops their mathematical reasoning at least once a week as a stand-alone lesson *however* pupils should be expected to reason their answers and those of others throughout their mathematics lessons. Key questions are:

    - ✓ *What do you notice?*
    - ✓ *What's the same?*
    - ✓ *What's different?*
    - ✓ *What's your conjecture?*
    - ✓ *Are you convinced?*

Mathematics in Practice: Early Morning Work

During morning registration all pupils are invited to develop their mathematical fluency by responding to a calculation that they solve in at least three ways, for example, 7 X 5 = 7 + 7 + 7 + 7 + 7

Mathematics in Practice: Times tables

Pupils should have times tables practice regularly. In years 2, 3, 4, 5 and 6 this involves using *Autopress* Speedy Times tables at least three times a week, in addition to the usual maths lesson, not as part of it. *See rubric in appendices, page 9*

Mathematics in Practice: A Typical Maths Activity

1. Reflect on marking by the teacher. Carry out "next steps" and/or correct errors
2. Mini challenge in timed conditions. See rubric in appendices
3. Counting – with a counting stick (This can be done outside of the maths lesson, during another part of the day)
4. Main activity – making use of opportunities to use models and images, to conjecture, convince and reason
5. Plenary – discuss progress made, listen to various groups, to reason, convince and share understanding. Complete 'I know I've made progress' speech bubble. See appendices page 10

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Mathematics in Practice: Assessment

We use the Assertive Mentoring assessment programme as our formal assessment of mathematics. A baseline assessment is carried out in early September. Year groups are referred to as stages in the programme, thus year 1 is stage 1. Assertive mentoring tests can be found in the 'apps' folder on the school server. There are six tests, designed to be used half termly but we use test 1 as a baseline test in early September and re-test using it a second time at the end of the first half term (week 6 or 7). The purpose of testing is to

- ✓ identify areas for development for all pupils which inform planning
- ✓ inform pupils of significant areas of development (no more than three)
- ✓ enable the teacher and teaching assistant to have clearly identified groups of pupils to focus on and know what the focus is
- ✓ identify areas of strength

Following half termly Assertive Mentoring testing teachers must complete a gap analysis of the test. We also use short assessment opportunities using Assertive Mentoring tests fortnightly. Gaps identified through these short tests inform teachers of what pupils need to learn and teachers address these between one test and the other. These are placed in the pupil's maths book. The half termly test provides a summary picture of a pupil's ability and class performance and contributes to a teacher's half termly assessment. The summary is passed onto the subject leader and assessment leader. See alosp Mathematics Planning rubric, page 11.

As well as testing teachers are expected to mark maths books regularly. Specifically this means

- ✓ Marking work at least three times per week in depth
- ✓ Marking all calculations, including those self or peer marked
- ✓ Writing a subject specific comment, such as, 'You set your work out carefully and this helped you to be successful'. Generic marking, such as 'good work' is not acceptable
- ✓ Asking pupils to correct one or two errors

Test schedule

Approximate date	Assertive Mentoring Half Term Test
Early September	1
Mid October	Repeat 1
Late December	Test 2
Mid February	Test 3
Late March	Test 4
Late May	Test 5
Early July	Test 6

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Intervention

We believe high quality mathematics teaching by qualified teachers is essential. Additional adults may be deployed by the teacher to work with pupils in class or outside as a small group but the teacher should generally work with those who need to make the most progress.

Role of the Subject Leader
The mathematics subject leader is responsible for co-ordinating, managing and leading mathematics throughout the school. This includes:

- ✓ writing an annual action plan for mathematics
- ✓ ensuring continuity and progression from year group to year group through monitoring of planning, observations, book-looks and Pupil Progress Meetings
- ✓ advising on In-Service Training to staff where appropriate. This will be in line with the needs identified in the maths action plan and within the confines of the school budget and in consultation with the InSeT manager
- ✓ advising and supporting colleagues in the implementation and assessment of mathematics throughout the school using, for example, calculations audits and test analysis
- ✓ assisting with requisition and maintenance of resources required for the teaching of mathematics as requested. Again this will be within the confines of the school budget

Role of the Vertical Team Member

Each year group has a maths planner who is responsible for ensuring maths is discussed at year team meetings. They are expected to have an overview of the strengths and areas for development within their year team. The vertical team members in each year team meet every term to discuss any issues in mathematics and to help complete the termly subject report

Role of the Classroom Teacher

- ✓ to plan for progress based on test analysis to ensure all pupils, regardless of class, ethnicity, gender, age, ability or religion make at least expected progress
- ✓ to provide a series of learning opportunities using the planning format in order all pupils make progress – go to **!! A maths folder for 2016-17 – A Planning Folder – Blank Unit of Study Plan** on the school server. *See appendices, page 11*
- ✓ ensure progression in the acquisition of mathematical skills with due regard to the national curriculum for mathematics. Teachers must plan for progress using a progress check 1 (baseline) and progress check 2 model
- ✓ to develop and update own skills, knowledge and understanding of mathematics
- ✓ to identify pupils underperforming using regular marking and formal testing and to address these accordingly
- ✓ to keep appropriate on-going records
- ✓ to plan activities that develop the using and applying of mathematics, for example, using Nrich materials

- ✓ to inform parents of pupils' progress, achievements and attainment

Resources

- ✓ Resources for maths are kept in various cupboards in the lower corridor. Resources may be borrowed from the cupboards and returned as soon after use as possible to enable others access to them. The keys to both locked cupboards are kept in G9 on a hook on the wall.
- ✓ All classes have a collection of "trugs", or caddies, to contain essential practical resources for adults and learners to use during *all* maths lessons. It is expected that these resources are brought out during maths activities to wherever they are needed – the table top or floor area. Learners are expected to choose the necessary equipment to aid their thinking. Adults are expected to be able to use the resources
- ✓ The ordering and management of the resources is the responsibility of the subject leader

Non Negotiables

- ✓ At St Nicholas Priory we use Assertive Mentoring to assess and then plan for learning opportunities using the whole school planning format. A daily lesson plan is not necessary
- ✓ All class teachers are expected to plan and assess their individual class
- ✓ Lesson plans and books are regularly looked at by the maths subject leader and shadow maths leader
- ✓ The application of mathematical knowledge and thus the opportunities to develop mathematical thinking is central throughout the national curriculum. Pupils must be given opportunities to apply their mathematical knowledge
- ✓ Class teachers are expected to teach maths every day
- ✓ Early morning work in maths should be done every day during morning registration, 8.40 – 9.00

Equal Opportunities

All children have equal access to the curriculum regardless of gender, class, ability, faith or stage of development. This is monitored by analysing pupil performance throughout the school to ensure that there is no disparity between groups. Where disparities are evident actions are taken to address these, for example, girls are able to choose who to sit with and may prefer to learn alongside other girls.

Parental Involvement

At St Nicholas Priory C.E. V.A. Primary School we encourage parents to be involved by:

- ✓ asking them to support their child's independent learning at home. See appendices, page 10
- ✓ informing parents of their child's specific learning targets in mathematics
- ✓ encouraging parents to help their child achieve their target(s) in mathematics
- ✓ inviting parents of Year 6 learners to a meeting on supporting their children with SATs

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Access

On the server staff may find various resources and articles

- ✓ Go to PUBLIC – Staff Only – !! A maths folder for 2016 -2017
- ✓ Find:
  Calculations Audits and summaries
  Whole school planning format (all teachers are asked to use this)
  Maths Policy 2016
  Calculation Policy 2015 (currently under re-construction)
  Nrich Problems KS2 for the new curriculum
  Rising Stars Vocabulary For the New Curriculum
  2016 Test Framework – end of KS2 test structure

Subject Leader and Nominated School Governor

At St Nicholas Priory C.E. V.A. Primary School the subject leader for mathematics is Mr James Little

The shadow leader for mathematics is Mrs Nicky King

Mr Alan Zhang is the identified governor for mathematics

Adopted by governors on date: 12th September 2016

Signed ……

Name ……..

(On behalf of the Governing Body)

Review date: September 2017