JOHN BALL PRIMARY SCHOOL

ACHIEVEMENT, AMBITION AND PROGRESS FOR ALL...

Mathematics Policy and Protocol at John Ball School

A high-quality mathematics education provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. (National Curriculum 2014)

Policy reviewed January 2018
Thomas Weddell

Introduction

This document is a statement of the aims, principles and strategies for the teaching, learning and assessment of Mathematics at John Ball Primary School. This policy will be reviewed in the light of any subsequent curriculum changes. This policy stands alongside our over-arching policies on Learning, Teaching and assessment.

Our View of Mathematics

"Mathematics is a proficiency, which involves confidence and competence with numbers and measures. It requires an understanding of the number system, a repertoire of computational skills and an inclination and ability to solve problems in a variety of contexts. Mathematics also demands practical understanding of the ways in which information is gathered by counting and measuring and is presented in graphs, diagrams, charts and tables.

It is our aim as teachers to help children to acquire this proficiency and make good progress in their learning by giving a clear focus to the relevant aspects of the National Curriculum programmes of study for Mathematics. Through our planning we also aim to provide opportunities for children to recognise the links between the various topics within the mathematics curriculum.

Curriculum Aims

The National Curriculum for mathematics sets out three key targets that underpin the teaching of primary mathematics:

- **Become fluent in the fundamentals of mathematics**, including through varied and frequent practice with increasingly complex problems over time, so that pupils have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems
- **Be able to reason mathematically by following a line of enquiry**, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- **Pupils can solve problems by applying their mathematics understanding 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.

Our aims in teaching Mathematics at John Ball School are:

- To ensure that all children make consistently 'good' progress through each individual term
- To develop a school ethos of positivity around the subject of mathematics.
- To help children understand how maths is useful to them (e.g. financial capability)
- To help children develop the skills, concepts, strategies, and understanding that underpin mathematical thinking and calculating
- Ensure that children understand mathematics as a tool for life in practical everyday situations
- To give children the confidence to independently solve problems
- To give opportunities to work collaboratively and independently
- To help children see the links in mathematics and how it is used in other subjects
- To offer additional support to individuals who are making either 'not age expected progress' and 'exceeding age expected progress'
- To facilitate children when reviewing their own learning using skills and information to manage their own mathematical development
- To help children develop the skills to reason and communicate their mathematical thinking in verbal, written and pictoral form
- To allow mathematical understanding to grow by giving time for reflection, dialogue and discussion.

Our Pupils will learn to:

- Develop the appropriate mathematical language associated with number, shape and position.
- Use and apply mathematics in practical tasks, in real life problems and in acquiring further knowledge, skills and understanding in the subject itself.
- Understand and use the four operations of number in relevant contexts
- Understand relationships between numbers, learn basic number facts and develop a range of computational methods
- Understand place value in our counting system and understand how it can be extended into numbers below zero
- Use their mathematical skills in simple problem solving
- Collect, interpret and represent data in tabular, graphical and diagrammatic form
- Develop mental methods of calculation
- Recognise, describe and represent shapes and patterns in terms of their properties, location and movement

- Measure quantities including length, area, volume/capacity, angle, temperature, time and mass
- By the time children reach Year 6 they will be introduced to ratio/ proportion and language of algebra as a means for solving a variety of problems.

As teachers we achieve the these aims by:

- Promoting a positive view of mathematics around the school and contributing to a 'we can' mathematics ethos
- Use of the curriculum guidance for the foundation stage for mathematical development in the nursery and reception classes;
- Use of the structured programme of maths provided by the our learning ladders assessment and planning tool, which ensures coverage of the National Curriculum by the end of Year 6;
- Teaching a daily maths lesson in KS1 in KS2 which will include some a variety of oral / written challenges, mental maths skills, calculation practice and problem solving / investigating. In KS1 and lower KS2 it may be appropriate to separate the sessions and teach them at different times throughout the day;
- Adapting plans and provision using a range of teaching and learning strategies
- Having high expectations about the way pupils work and the standard of presentation.
- Ensuring that there is additional provision for those children identified as being below the expected levels in the tracker
- Provide additional mental and oral practice outside the math's lesson
- Making maths learning meaningful by setting maths in everyday contexts;
- Planning cross curricular links where suitable and appropriate
- Providing a stimulating and supportive maths environment with access to supportive equipment.

We will assess the success of our mathematical teaching by:

- Evaluating the motivation and interest displayed by our pupils around the school on a daily basis
- The quality of maths thinking displayed around the school (in corridors and classrooms)
- Success in meeting targets (especially meeting targets for children who are key marginals in each class)
- Data analysis (ongoing Learning Ladder Assessment)

- Moderation sessions reviewing the quality of work and presentation in children's books (three moderation points per year)
- Assessment of marking and quality of feedback that our children receive
- Observations of the teaching of mathematics
- Shared planning opportunities (both medium and short term)
- KS1 and KS2 SAT results

Planning for Mathematics at John Ball

In EYFS we use the Early Years Foundation Stage profile and the Early Years development matters document to support and plan for purposeful play based mathematical experiences within the learning environment. As the pupils progress through, more focus is placed on representing their mathematical knowledge through more formal experiences. For example, pupils will be encouraged to record their mathematical thinking when ready and this will increase throughout the year. Through mathematical observations during child led play and guided sessions, adults in the unit will assess and plan accordingly. It is important that we are flexible with our planning to allow for child led and child initiated mathematical ideas to be explored and extended within the learning environment.

In EYFS, guided group activities are timetabled and planned for carefully. Nursery have at least one learning session per week which has a maths focus ranging from number to shape, space and measure. In Reception, we have a guided maths session that is teacher led daily as well as an ongoing mathematical workshop/station that the children are able to access freely. Guided mathematical activities happen within a two week period in Reception. This is in addition to consistent scaffolding and modelling by adults to enhance children's mathematical development through play.

In EYFS children learn mathematical concepts through playing and exploring, being active and through creative and critical thinking which will take place inside and outside. As a unit, we are keen for the children to be immersed in mathematical stories, games, songs and imaginative play to develop their understanding. There are also daily opportunities for counting and engaging in shape, space and measure in a variety of different contexts. In the learning environment we are keen for maths to be evident across all areas of learning. For example, in our home corners, cookies will have numbers on them, sections of pizza, numbered plates etc.

Maths in years 1-6 is planned using the White Rose framework to support our medium term and weekly planning. Before starting a unit or block teachers should look at the learning overview to get the 'big picture' and review prior learning and

adjust the plans accordingly to ensure that all children are sufficiently challenged or supported. Assessment of learning will take place continually and will support the development and personalisation of the plans.

The structure of a lesson is open to a teacher's view of what is required for their particular class or topic. Whilst we have moved on from the rigid structure of mental starter, main activity into plenary, we do expect to see these in evidence as these ingredients are still vital to a maths session. At the heart of our lesson structure is differentiation, which means that the teacher takes on the role of facilitator, juggling different types of learning simultaneously to offer children the opportunity to progress at their own pace. We also expect teachers to facilitate children taking control of their own learning by offering them opportunities to have a choice through our use of MUST, SHOULD, COULD and MIGHT activity structures.

Teachers in Yr 1-6 use the Learning Ladders framework and the Abacus maths scheme as additional resources to help the planning process. This is supported by the use of additional resources such as NCETM website, NRICH curriculum mapping documents and additional resources that have been provided for each year group.

Year groups plan together but personalise the plans to meet the needs of the learners in their classroom. (Further guidance on vital ingredients for a maths plan can be found in the appendix).

There is a **Calculation Policy** outlining the progression of the calculation methods. This policy follows the guidelines from the National Curriculum. Teachers must be aware that our calculation policy is not always matched in the Abacus Active Learn Mathematics Planning resources and should plan accordingly when ensuring that our children follow the calculation policy.

Interventions:

Interventions are provided to boost children's progression in maths and are tightly planned, with success criteria set and assessments made frequently to ensure progress is being made. Interventions are carried out mostly by our Teaching Assistants however it is the responsibility of the teacher to decide how it is planned and delivered. Communication is paramount to ensure the intervention is being carried out correctly and effectively. There are also opportunities for children who are working well above their age expected level children to explore facets of the curriculum beyond their year group targets. **NOTE**: Interventions do not take place during a maths session. It is of the upmost importance that all

children not matter what ability shares the communal experience of maths with their teacher in their classroom.

We use a range of additional maths intervention resources including:

- Y5 and Y6 PIXL Maths Club
- Y3 and Y4 Number Booster Pixl Maths Club
- Y2 In class 10 minute interventions run by class teacher

Assessment of Children's Learning

Assessment of mathematics is ongoing and is part of the teaching and learning process. **All** classroom based staff are involved in the assessment process use the following procedures to assess learning.

- Self and peer assessment
- Meaningful marking to the lesson objective and the success criteria; providing the next steps for children to make progress- 'closing the gap'.
- Observation of the learner
- Discussion with the learner and amongst learners
- Learning Ladders Ongoing Assessment on a weekly basis
- Use of unit problem solving sessions (using Rising Stars Unit Tests) to assess children's abilities as problem solvers on a weekly / fortnightly basis. **NOTE:** Such sessions should not be a test scenario it is more an opportunity to set key questions and ask children to explain (verbally and written) their mathematical thinking.

Teacher assessment and learner self assessments provide learner's targets and their next steps. Targets are shared with parents in the spring parent meeting.
Teachers use the Learning Ladder System as part of a continuous assessment process to identify the National Curriculum level and next steps for learners.
Periodic (termly) assessments are moderated between parallel classes and phase groups. Periodic and Transitional assessments (annual standardized tests -SATs, QCA) outcomes are loaded onto a whole school tracking programme.

Marking Mathematics

In accordance with our marking policy, orange and blue pens are used to respond to children's work. Please see marking policy for further information.

Learning Environment

All classrooms have a calculations display that models the suitable calculation strategies for the year group this display will be constant throughout the year. There should also be an exploring maths display that is purely examples of children's maths work / investigations / explanation posters that show the journey that children have been on. This display should be changed every three to four weeks to ensure that we celebrate different children throughout the year. This area should promote maths and excite learners. Displays will support learners and celebrate outcomes. If suitable, teachers can display the relevant vocabulary and the learning objectives and success criteria.

In KS1 and lower KS2 bar modelling (Singapore strategies in line with our calculation policy) and concrete model strategies are actively taught to learners at all levels. Visual support material such as 100 squares and number lines and some interactive activities are displayed and the use of them is modeled.
Learning equipment to support learning is labeled and stored in the number reference area and children are actively encouraged to select the equipment that will support their thinking. It is the teacher's responsibility to encourage children to independently choose and find the resources that will aid their abstract maths thinking.

Additional resources and teacher support materials are kept in a central store in the school library / maths resources cupboards.

Parental Involvement and Home learning

At John Ball we encourage parents to be involved in their child's learning and aim to support this partnership through clear communication and sharing of aims and methods. This is supported by our online tutorial that models maths calculation strategies and maths pictures for each individual year group. Teachers and learners will identify clear 'I can targets' from the Learning Ladders assessment tool and these will share at Parent Teacher Interviews in the spring term.

Maths homework is set using our online tool MyMaths; this work is differentiated to match the next step targets for each child (note: children who do not have access to a computer /internet at home are invited to in school homework groups). If a child is unable to access their homework online then it is the teacher's responsibility to set paper copies of the relevant work. Each week two pieces of homework will be set. The first the relevant times table that the class is focusing on. The second is in line with the unit that the class has been studying that week.

In years 5 and 6 Hegarty Maths is being trialed throughout 17/18 to support home learning.

The Role of the Maths Leader

The role of the maths leader is to ensure that all learners make expected and in some cases exceeded progress and ensuring that the necessary provision is set for all children to achieve age expected progress with over 80% of the year group achieving exceeded age expected in the Y2 and Y6 Sats tests Other roles include:

- Ensure that environment around maths in school is positive
- Lead and monitor the implementation of Policy
- Analyse and evaluate data – focusing on progress and achievement for all groups- and contribute to termly SIP
- Review standards in learning and teaching
- Support and develop colleagues in their own subject knowledge and provision
- Be responsible for resourcing
- Keep up to date with recent documentation and government policy-attending relevant CPD

Health and Safety

Following our guidance on Health and Safety in the classroom children will be guided on the safe use of potentially dangerous equipment such as compasses.

Maths Subject Leader: Thomas Weddell

Teacher's Toolkit- Vital Ingredients for Planning for Progression

- **White Rose Planning Framework the Abacus scheme (KS2) and Learning Ladders unit Sequences or the EYFS guidance** should be used as the main starting point for your plans. Plan a whole unit at a time; this can range from between 1 to 4 weeks according to the needs of your class.

- **Book Presentation** Please see Book Presentation exemplification document.

- **Planning for Progression** medium terms plans follow the structure of the White Rose maths planning toolkit which embeds planning for progression. During book looks and moderation meetings the SLT will

be actively looking for planning for progression in the children's maths books.

- **The learning cycle** -Remember that you need to consider the whole teaching and learning process: - review (prior learning), teach, practice, apply and review. Once you have reviewed what your class already know or do not know, further adjustment can be made to your plans to support the learners and accelerate progress.

- **Make the plan fit <u>your</u> class**. One size does not fit all. Review the activities –are they interesting and fun? Do they approach maths through VAK (visual, auditory and kinesthetic? Consider who needs support and what kind of support is needed. Are the activities too hard or too easy? Change them if it is required. Do not move on if you feel that additional days would support learning. Are children matching their ability with an accurate MUST, SHOULD, COULD or MIGHT learning goal?

- **Plan for Mental and Oral stand alone activities** – that take place during the day. Make good use of any additional ideas and resources (101 mental maths starters etc). Little and often works; it builds confidence and esteem and enables the children to work on skills to manipulate numbers in their head. You are asking the children to apply strategies and facts to quick fire questions. Make timed activities part of your menu.

- **Assessment for learning questions** – should be used throughout the lesson. This can take the form of a verbal discussion or a written response in a child's math book. Using probing questions in marking will offer opportunities for children to expand on their mathematical thinking. For example: *Tell me how you solved this problem. Why did you decide to subtract these numbers?*

  Assessment for learning questions can also be used by the children to direct their own learning. Add useful assessment for learning questions throughout your plan.

- Train children to 'green pen' respond and explain questions in their maths book.

- Identify individuals on your medium plan that you may wish to focus on in class- this may be with additional/different questions/different provision etc. **The assessment should be informed by the AF and other guidance.**

- **Guided learning groups** are identified from the assessments and are flexible groupings-make sure that you work with all groups in your class. Use the additional adult to support you to do this.

- **Identify the vocabulary** you will be focusing on in the unit. Make a note of the vocabulary on your plan. Remember to build in quick activities – (i.e. Make a maths dictionary at the back of the maths book?) to teach the vocabulary.

- **Problem Solving and Investigation activities in your plan.** Using and applying maths is key factor to being a successful mathematician. Open ended questions and tasks should be woven throughout the plan.

- **ICT** – When planning the unit, consider how ICT can be incorporated to improve teaching and learning – however the proviso is only use ICT if it improves the provision.

- Opportunities for **practical application** of maths in every day settings are very important.

- Opportunities for the use and practice of **tools and equipment-** number lines , calculators etc