BLACK HORSE HILL
INFANT SCHOOL

MATHEMATICS
POLICY

Approved by Committee 28th February 2019

Approved by Full Governing Body 21st March 2019

Signed _____**(Chair)**

Signed _____**(Headteacher)**

Mathematics Policy – Contents

The Nature of Mathematics – A Statement of Purpose

"Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore 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." (The New national curriculum in England framework document, July 2013)

Mathematics is a tool for everyday life. It is a whole network of concepts and relationships which provide a way of viewing and making sense of the world. It is used to analyse and communicate information and ideas and to tackle a range of practical tasks and real life problems. It also provides the materials and means for creating new imaginative worlds to explore.

Using the Programmes of Study from the New National Curriculum we aim to develop

- An enjoyment and curiosity of mathematics and for children to feel confident to become successful;
- Children's abilities to use and apply mathematics to solve problems in both the classroom and in 'real life' contexts;
- A confidence to communicate ideas in written form and orally;
- Independent and collaborative ways of working, encouraging children to share ideas and solve problems together;
- A wide range of mathematical vocabulary to be modelled and used in the classroom environment;
- The children's ability to recall mental facts accurately and quickly and using effective written calculation methods;
- Children's logical thinking, reasoning and ability to problem solve as transferable life skills.

Audience

This document is intended for use by all teaching and support staff, and for information to Governors, Inspectors and the LEA. It is reviewed every 2 years.

Curriculum Organisation

Our maths is now taught across the school aiming for all children to gain mastery in maths by acquiring a deep, long-term, secure and adaptable understanding of the subject. At any one point in a pupil's journey through school, achieving mastery is taken to mean acquiring a solid enough understanding of the maths that's been taught to enable him/her move on to more advanced material. When children have developed mastery there will be opportunities for them to show that they have greater depth using activities which require children to reason mathematically and solve problems with increasing sophistication.

We are also using elements of the Singapore style learning in maths using the Concrete Pictorial Abstract (CPA) approach. It is a three step instructional approach that has been found to be highly effective in teaching math concepts. The first step is called the concrete stage. It is known as the "doing" stage and involves children physically manipulating objects to solve a math problem. The pictorial (semi-concrete) stage is the next step. It is known as the "seeing" stage and involves using images to represent objects to solve a math problem. The final step in this approach is called the abstract stage. It is known as the "symbolic" stage and involves using only numbers and symbols to solve a math problem. CPA is a gradual systematic approach. Each stage builds on to the previous stage and therefore must be taught in sequence.

In our Maths curriculum we now know how fundamental it is that we are encouraging and developing 'growth mindset' in our children alongside mastery in maths

'A growing body of evidence that pupils' mind sets play a key role in their math and science achievement. Students who believe that intelligence or math and science ability is simply a fixed trait (a fixed mindset) are at a significant disadvantage compared to students who believe that their abilities can be developed (a growth mindset)'. (Dweck 2008)

So our school is focusing on developing a classroom culture that values mistake-making and viewing things that are tricky as a welcome challenge. A growth mind-set has been shown to enable children to tackle genuinely difficult tasks because they are not afraid of making mistakes but can learn from them. Children with a 'fixed mind-set' on the other hand, become disheartened by mistakes and will therefore opt for easier tasks that reaffirm their belief in themselves.

As part of journey to develop mastery in maths and growth mind-set each year group are teaching the children in mixed ability groups where all children tackle the same problems using CPA to support the different learners. Teachers will delve deeper using high quality questioning to support and develop learning and understanding.

In Foundation Stage the EYFS document is being used as well as planning from the White Rose Maths hub which is on the NCETM.
Pupils are encouraged to develop their problem solving, reasoning and fluency in a broad range of contexts in which they can explore, learn, enjoy, practise, discuss and extend their skills. Pupils are encouraged to exploit their mathematical potential in both indoor and outdoor enabling environments. They are provided with a wide range of activities that promote regular active participation, exploration of real life problems, development of imaginative play and early experience of mathematical language. All pupils are supported positively and encouraged to gain confidence and competence in their skills.

In Key Stage One when planning the aims of the national Curriculum are followed along with the White rose planning. The mathematics curriculum is divided into blocks using the White Rose yearly overview for Year One and Year Two
The principal focus of mathematics teaching in Key Stage 1 is to ensure that pupils develop problem solving, reasoning and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources. The environment will be vocabulary rich and there will be endless opportunities for children to reason mathematically.

Time Allocation

Early Years Foundation Stage – daily mathematical teaching, activities and opportunities.
Key Stage 1 – 4/ 5x 45 minute lessons
15 mins -Daily fluency to recap on previous learning

Teaching and Learning Strategies

- In Key Stage 1 the format of the lesson will be that promoted by White Rose and elements of the Singapore style lesson.
- Each lesson should have a clear focus linked to the Key Learning Intentions for that Year Group. The timing of the lesson should be 45 minutes with 15 minutes daily for mental maths.

- Depending on the session. Some will have a hook question to get the children thinking, talking and reasoning about maths using CPA. There will also be range of learning opportunities including whole class, group, paired and individual work.
- There will be a strong emphasis on oral work with many opportunities for children to express their mathematical thinking both to the teacher and to each other.
- Teachers will ensure the inclusion of all children in all parts of the lesson through high quality differentiated questioning and targeting of select children. Questioning will be at times targeted and closed for assessment purposes. It will also be open-ended and will promote a variety of responses and possible correct answers.
- Practical apparatus will be clearly labelled and accessible on a helpdesk. Working walls within the classroom will reflect the mathematics taking place.
- Teachers will plan the lesson to maintain a brisk pace. There will be, in the short-term plans, flexibility so that teachers can re-visit, extend or reinforce work, as they feel necessary.
- Pupils will be involved in self assessment, reflecting on their own progress and understanding during the lesson
- Lessons will be regularly monitored by the Headteacher and by the Subject Co-ordinator.

Information and Communication Technology (ICT) and Mathematics

ICT enhances good mathematics teaching and is used in lessons only if it supports, enhances and motivates learning and is used when it is considered to be appropriate to meet the needs of the child. For example, by using a computer or IPAD, children in Key Stage 1 can: practise and consolidate number skills, explore and explain patterns in data, use a floor turtle to estimate and measure length, angle or time, experiment with and change patterns in shape and space and develop their mathematical vocabulary, logical thinking and problem solving skills.

ICT includes the calculator and extends to the whole range of audio-visual aids, including audiotape, video film and educational broadcasts. ICT is used when the children can achieve more effectively with it than without it.

Planning

We plan and teach to the National Curriculum Programmes of Study to ensure progression and curricular entitlement.

All medium term plans are based on the block plans from the White Rose Planning (NCETM) and are directly related to the National Curriculum. The short-term or weekly plans expand these ideas and give more detail on the presentation of the work to be covered. Short-term planning sheets include mental strategies, vocabulary and assessment and homework opportunities as well as the main objectives and activities.

All Year groups will use the calculations policy when planning to ensure there is continuity and consistency through the school. Our aim is that children leave Blackhorse Hill Infants equipped with mental, written and calculator methods they understand and can use correctly and that when faced with a calculation, they are able to decide which method is most appropriate and have strategies to give an approximate answer and to check their solutions.

Assessment, Recording and Reporting

Reference should also be made to the school's Assessment and Marking Policies.

A variety of methods will be used to assess mathematical understanding. These will include questioning, listening to explanations, formal tests, observation of investigations and games. Written work only forms a small part of the assessment process in the early stages of maths.

Informal assessment is part of the ongoing process and occurs each day. This will not necessarily be recorded but can be used to inform future and immediate planning. Individual children may be monitored in this informal way if the teacher has any concerns about their progress. Teachers also track progress by completing lesson evaluations daily and weekly.

Periodic assessment will take place usually at the end of a topic or at the end of each half term. Assessments will usually be based on the key objectives of that year group. In Key Stage 1 children will have a levelling sheet stuck in the front of their book. This sheet will provide evidence of Numeracy objectives achieved by the children and will also identify the next steps in their learning. Numeracy levels will be recorded in Update files. The Updated Files are monitored by the Headteacher each half term. These will be passed on to the next teacher and will show how individual children have achieved against the key objectives covered that year. Year 2 children will also have SAT's results to be used in conjunction with the class grids. These results will be analysed to inform pupil progress and inform future planning and target setting. They will also be used to report individual progress to parents.

Target Setting.

At the end of Foundation 2, foundation profile scores will be used to set numeracy targets for children to achieve at the end of Year 1 and Year 2. These targets are reviewed throughout the year and intervention is planned for individuals who are not expected to achieve their targets. Individual and class targets are also set by each class teacher using levelling criteria and Assessing Pupil progress Materials.

Evidence of Attainment and Recording Achievement

Evidence of attainment in mathematics can take a variety of forms. These may Include:-

- Samples of children's written work.
- Models or photographs.
- Observation of the children at work.
- Questioning and discussion work with individuals and groups of children.
- Use of tests.
- Lesson Evaluations

Marking

All marking is in line with the methods set out in the Marking Policy. Teachers aim to mark whilst the child is present when ever possible, so that problems arising can be dealt with immediately. Response time should be given so children can reflect on their learning wherever possible.

Role of the Numeracy Team leader

The role of the teacher responsible for mathematics will include the following:-

- Responsibility for the formulation of the policy.
- Monitoring and evaluation of the success of the teaching of mathematics, through the monitoring of lessons and pupils' work.
- Supporting staff in their planning and methodology.

- Presenting and organising in-service training for other members of staff.
- Attending relevant training and co-ordinator meetings and feeding back to staff.
- Responsibility for advising on and ordering resources.
- Analysis of assessment results and SAT's to inform target setting.
- The writing of Action Plans.
- Participation in the overall evaluation of the success of mathematics teaching and pupil achievement.
- Presenting Maths sessions to parents.

Resources

Each classroom has its own stock of practical resources for everyday use. Their storage and maintenance is the responsibility of the class teacher.

Resources will continue to be developed to support the teaching of mathematics throughout the school.

Equal Opportunities

All children have entitlement to all areas of mathematics. See relevant policy.

Special Needs / Differentiation

At Black Horse Hill we aim to ensure that all children reach their full potential. Activities are planned so that each child gets a sense of achievement at their own level. Teachers will target children sometimes so that they can be supported as appropriate. Similarly support can be used so that some children benefit more from adult intervention or support. The use of the CPA will also support any children who need it. Children with specific mathematical problems will have appropriate Individual Educational Plans.

Working With Parents / Homework

The school recognises the role that parents have to play in their children's mathematical learning. We also realise that some parents lack confidence in their ability to fulfil this role. Through the setting of weekly homework activities we aim to inform the parents of the type of games and activities that will complement the work being undertaken in the classroom. These are not often written tasks but are oral games and investigations that reinforce the current work. Some work may be recorded but the aim of the activities is fun!

Mathletics is used as an online support for Maths in school and at home. Each child from Foundation Two, Year One and Year Two has a login and password to access at home. We encourage children to practise their skills and will also use the website as part of homework.

At the beginning of each academic year the staff present an informal talk to the new parents describing the philosophy of the New National Curriculum This meeting is open to all interested parents.

Risk Assessment

Teachers will write risk assessments when necessary and in line with guidance.

J. Fitzgerald

January 2019