LAYFIELD PRIMARY SCHOOL

Mathematics Policy

November, 2017

Review date: November, 2018

1. Introduction - The Importance of Mathematics

1.1 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.

1.2 Mathematics equips pupils with a uniquely powerful set of tools to understand and change the world. These tools include logical reasoning, problem solving skills and the ability to think in abstract ways. It has a crucial role to play in equipping young people to meet the responsibility of adult life.
The subject transcends cultural boundaries and its importance is universally recognised.

2. Aims

2.1 Mathematics is a core subject within the National Curriculum.

2.2 Our aims in teaching mathematics are that all children, **regardless of gender** will:

- Become fluent in the fundamentals of mathematics, 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, proposing 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 solution.

- Promote attitudes towards mathematics and an enthusiasm for mathematics work in the school.

- Use mathematics to analyse and communicate information.

- Develop mathematical understanding through practical tasks, enquiry and experiment.

- Create an awareness of the relevance of mathematics in the whole curriculum.

- Enjoy the subject and study it with confidence and a sense of achievement, whilst developing an awareness of the aesthetic qualities of mathematics.

- Achieve a high standard in numeracy and a range of other mathematical skills.

- Apply these skills with confidence and understanding when solving problems.

- Be able to use their mathematical skills to communicate ideas, to predict, explain and verify.

- Be able to discuss and present their methods and reasoning using a wide range of mathematical language, diagrams and chart

2.3 Mathematics is taught according to the objectives of the **National Curriculum September 2014.** This means that:

- All children are taught mathematics daily, for approximately one hour each day at Key Stage 1 and 2. In Early Years children have adult led Maths activities throughout the week and have self-initiated maths based activities set up in the classroom.

- Delivery of Daily Mathematics Lessons will be flexible but will incorporate a mental starter, the main proportion of the lesson being taken up by direct teaching with follow-up work and with mini plenaries throughout the lesson, ending with a longer plenary. The timings within individual lessons will be adjusted at the discretion of the class teacher to ensure the more able are adequately challenged and the less able fully supported.

- Children with Special Educational Needs and Gifted and Talented will be catered for individually.
- Follow-up work can be in groups, pairs, individual or whole class.
- There is a balance between numerical work, data and spatial awareness.
- ICT is widely used to aid the teaching and learning of all children.

2.4 Mathematics is an interconnected subject in which pupils will be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains. Pupils will make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

2.5 The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, through additional practice, before moving on.

2.6 Much emphasis is given to the acquisition of number facts (which include tables) and the application of mathematical skills.

2.7 Children in any Key Stage will have the opportunity to develop the technical skills involved when or if it is appropriate.

3. Technology

3.1 Calculators are not be used as a substitute for good written and mental arithmetic. They therefore are only to be introduced near the end of key stage 2 to support pupils' conceptual understanding and exploration of more complex number problems, if written and mental arithmetic are secure. Technology is used to support learning and teaching where appropriate throughout the school. Every classroom has an interactive whiteboard, which is readily used to enhance lessons.

4. Homework

4.1 Homework is issued regularly and helps to consolidate teaching delivered through the day.

5. Excellence in mathematics

5.1 Excellence in mathematics is celebrated in displays, assemblies and certificates to reward achievement.

6. Attainment targets

By the end of each key stage, pupils will be expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

7. Targets

7.1 All children within school have group targets to work towards during mathematics lessons.

- These targets are set by the class teacher and are based on the SPRINT objectives, taken from the National Curriculum.
- Children are aware of their group targets and are greatly encouraged to take ownership of them.
- Targets are adapted, developed and changed according to assessment outcomes and the needs of the children.
- Targets are displayed in class for the children to refer to.

8. Next Steps in Learning

8.1 All children within school are aware of their next steps in learning and are encouraged to work towards these during mathematics lessons.

8.2 Next steps are adapted, developed and changed according to assessment outcomes and the needs of the individual child.

9. Key Stage 1

9.1 The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This involves working with numerals, words and the four operations, including with practical resources (e.g. concrete objects and measuring tools).

9.2 At this stage, pupils develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching will also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

9.3 By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.

9.4 Pupils will read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

10. Lower Key Stage 2

10.1 The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This ensures that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

10.2 At this stage, pupils develop their ability to solve a range of problems, including simple fractions and decimal place value. Teaching will also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It ensures that they can use measuring instruments with accuracy and make connections between measure and number.

10.3 By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.

10.4 Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

11.Upper Key Stage 2

11.1 The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.

11.2 At this stage, pupils develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and in measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

11.3 By the end of year 6, pupils will be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages. See Separate Mathematics Policy.

11.4 Pupils read, spell and pronounce mathematical vocabulary correctly.

12. Cross-curricular Links

12.1 Mathematics in particular is linked to work in other curriculum areas. These include Science, Geography, Technology and Art and Computing. At Layfield Primary School, computing enhances good mathematics teaching. It is used in lessons only if it supports good practice in teaching mathematics.

12.2.Any decision about using computing in a particular lesson or sequence of lessons is directly related to the teaching and learning objectives of the lessons. Computing may be positively used to support the learning styles of different groups of children and to provide a visual and/or “hands on” approach to the teaching of particular concepts.

13.Spoken language

13.1 The national curriculum for mathematics reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. 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. The importance of developing the pupils' mathematical language cannot be stressed too strongly. Language plays an essential part in the formulation and expression of mathematical ideas. From the earliest days at school, pupils are encouraged to discuss and explain the mathematics they are doing with their teacher and with other pupils so they can share ideas and develop and refine their understanding.

13.2 To sum up, mathematics is a valuable tool for encouraging pupils at Layfield Primary School to develop their skills and understanding in

- Speaking
- Listening
- Group discussion and interaction

14. The Role of the Mathematics Subject Leader

14.1 The role of the Mathematics Subject Leader is:

- To provide support for other members of staff to enhance the delivery of the Revised Primary Framework for Mathematics.
- To monitor the implementation and teaching of the New Primary Curriculum for Mathematics.
- To carry out lesson observations, planning and book scrutinies and give feedback to members of staff.
- To monitor the implementation, assessment and development of target setting within mathematics.
- To develop and look after the maths resources in school.
- To keep up to date with current mathematical thinking and disseminate to staff.

15. Assessment and Recording

15.1 Assessment and recording of a child's attainment will be made by:

- Continual assessments made through mathematics lessons.
- Marking of children's work, which will often include individual comments as to achievements and targets. Staff will mark in green for work that is correct and for achievements and mark in blue for work that is incorrect and areas to improve. Staff will give time for the children to read their own comments or talk to the children about their work and correct their own work. Staff will then check the corrections.
- Assessments from mental maths tests and pitch and expectation questions.
- Half-termly assessments of children's attainment, judged against the SPRINT objectives.
- Half-Termly recording of attainment through the SPRINT tracking system.
- Termly moderation of children's attainment, judged against SPRINT objectives.
- Baseline Assessments for children coming into school.
- End of Key Stage One and Two SATs (Years Two and Six only).
- Parents' Consultation Evenings are held twice a year, which will include reference to attainment, application and attitude.
- Staff in Key Stage 1 and Key Stage 2 provide termly progress reports to parents/carers.

- Mathematics achievements will be reported to parents in the Summer Term as part of the annual report as well as specific areas to improve. At the end of all Key stages the pupil's attainment level is also reported to parents.

  These assessments:

  - Inform future planning
  - Provide information about the individual or group
  - Provide summative information
  - Provide information for parents
  - Contribute to pupil's assessments (Cohort Data)
  - Provide information for the cohort action plans.

16. Maths Resources

16.1 Maths apparatus is kept in individual classrooms or in the Maths resource cupboard. All classrooms should have a variety of visual apparatus to aid their children's learning. Mathematical vocabulary should be displayed around each individual classroom.

16.2 Some resources are aimed towards specific year groups. Where the children have special needs, teachers may need to use material from other year groups.

16.3 There is a wide range of interactive computing resources for each year group on the network. They can be used within the classroom to aid teaching and learning alongside the interactive whiteboards or in the computing suite for individual children to use as part of mathematics lessons.

16.4 A list of resources is available to help staff locate equipment they require.

17. Conventions for children's presentation of work

17.1 In pieces of written work the numerical date must be written for each new piece of work, e.g. 13.12.16. This will allow time to be spent more effectively completing tasks related to the lesson and to develop children's understanding of time vocabulary and the relationship of numerals.

17.2 The title should relate to the learning objectives in each lesson.

17.3 Key Stage 1 and Key Stage 2 children begin by completing mathematical written work in square books, Correct place value is important and should be insisted on when recording and presenting work. In Early Years children have individual files for which their work is collated.

17.4 Marking is in line with the school marking code (see marking policy). Children are also involved in self or peer marking.

17.5 Where appropriate, pages may be folded to allow neat and well-presented completion of written calculations.

17.6 In Key Stage 2 page numbers and part numbers must be written for each question if working from a textbook.

17.7 Rubbers should be used at the discretion of the teacher.

17.8 Displayed maths work is presented in line with the display policy.

17.9 At all times neat, legible and well-presented work is important.

18. **School Self – Review**

18.1 As part of the SSE cycle the mathematics subject leader will monitor planning and pupils' work throughout the school. The subject leader regularly carries out walk-throughs, observations and carries out pupil interviews.

19. Special Educational Needs and Gifted and Talented

19.1 All pupils with Special Educational Needs will have access to the Mathematics curriculum, with differentiated activities where appropriate.

19.2 Teaching Assistants will work closely with our pupils in a supporting role.

20. Partnership with Parents/Carers

20.1 Parents are encouraged to participate in their child's education. They are informed of the areas at Parents evenings and via half termly newsletters.