Mathematics Policy

Approved by Governors June 2016

To be reviewed by June 2018

Information Page

These documents are referred to or link to this policy

Teaching, Learning and Assessment Policy
Calculation Policy
Marking and Feedback Policy
Mathematics Medium Term planning grids
SEND Policy
Curriculum Maps
Social, Moral, Spiritual and Cultural document linking to Mathematics
Termly Raising Attainment Plan
School Development Plan
Annual Monitoring Cycle
Pupil Premium Grant Action plan – website
William Reynolds Mathematics Assessment
Equal Opportunities policy

Rationale

At William Reynolds Primary and Nursery School, we believe that 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.

Vision and Values

We believe that pupils' well-being is at the centre of our life in school and the key to raising academic success. This is supported by high expectations and by developing personal awareness, creativity and social understanding.

As part of our commitment to providing every pupil in school with a quality, enjoyable, enriched learning experience, we recognise that Mathematics is a fundamental skill that needs to be nurtured, encouraged and celebrated at every stage of development. We recognise that the skills of Mathematics impact across the whole curriculum, for example, measuring and recording data in Science or analysing timelines in History.

We believe that the teaching of mathematics should inspire and excite pupils. At William Reynolds Primary and Nursery School, mathematics lessons are planned to teach our pupils to be able to calculate reliably and recall facts fluently. They are also encouraged to make choices about the most efficient methods they could use. Problem solving is at the heart of our Mathematics curriculum. As a school, we recognise the importance of challenging pupils and ensure that they are given various opportunities to reason mathematically and develop their mathematical problem solving skills.

We are committed to raising pupils' aspirations and widening their horizons through a context rich curriculum that gives purpose to their learning, offers a range of experiences, as well as, broadening understanding of the global community. Wherever appropriate our Mathematics curriculum is linked to other curriculum areas and gives pupils the opportunities to develop specific skills and reinforcing skills already established in different contexts. We are committed to providing opportunities to promote pupils' spiritual, moral, social and cultural development in Mathematics. (See appendix 1- SMSC in Mathematics)

Aim

At William Reynolds Primary and Nursery school our aim is to improve pupils' mathematical subject knowledge and support them in developing a life-long approach to enjoying all aspects of the subject.
We do this by encouraging pupils 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.

Expectations

By the time pupils leave our school, we expect them to have a good understanding of number and place value, addition and subtraction, multiplication and division, fractions (including decimals and percentages), ratio and proportion, measurement, geometry, statistics and algebra.
We want every pupil to be able to make choices about the mathematics that they use and to be able to apply these mathematical skills when solving problems and reasoning mathematically.
By the end of each academic year, the majority of pupils in each class will be working at National Standard.

Planning

The National Curriculum 2014 forms the basis of teaching, learning and assessment.

Our whole school medium term planning for mathematics has been created in line with the National Curriculum 2014 and ensures that our curriculum is broad and balanced. These medium term plans are used as a guide for teachers and include links to a range of mathematical problems and challenges.
Our school's Calculation Policy and assessment grids and are used as a starting point for teachers when completing their short term planning. These resources help to ensure that work is differentiated and pitched with the correct level of

challenge. Teachers are encouraged to teach a series of lessons based on a specific objective. This begins with an assessment for learning opportunity, teacher demonstration and modelling of a method or concept, pupils practicing and consolidating new ideas or skills and concludes with pupil's being given opportunities to apply this knowledge to solve problems, self-evaluate their learning or reason mathematically. Teachers plan closely with year group partners to ensure consistency of opportunity for all pupils.

Clear learning objectives and success criteria are set for each session and are shared with pupils. Teachers differentiate according to the needs of the pupils and use intervention programmes for targeted support. ICT is used where it enhances, extends and complements mathematics teaching and learning.

Teaching and Learning

Using the Curriculum Maps and Mathematics Medium Term Planning, teachers plan for contextual mathematics. Where ever possible, maths lessons are linked to texts being covered in Literacy, current year group or whole school themes or other curriculum areas. Teacher also plan an arithmetic lesson once a week to keep pupils skills in number operations up to date.

There is a high expectation for pupils to record accurately and with good presentation. Every lesson has a learning objective and success criteria for pupils to achieve.

All mathematics lessons begin with an "Assessment for Learning" activity, where pupils are given opportunities to show what they already know. This then informs the teachers of their level of understanding and provides an opportunity for activities to be adapted, ensuring children are being appropriately challenged. The plenary at the end of a lesson often refers back to the "Assessment for Learning" activity to assess the progress that children have made.

During the week, pupils will be given the opportunity to self-evaluate their mathematics against their success criteria. (see Teaching, Learning and Assessment Policy).

Calculation Policy

As a school we strongly believe in the use of models and images to support the teaching and learning of mathematics and this is evident in our Calculation Policy. Appropriate models and images are used to move from the concrete to the abstract and support independent learning.

The Calculation Policy has been developed in line with the National Curriculum 2014. The purpose of this policy is to ensure that there is a whole school clarity and consistency in the strategies and methods used. Staff regularly access and acknowledge the Calculation Policy.

Verbal Reasoning

At William Reynolds Primary school, we firmly believe in the views of the National Curriculum 2014. 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.

Inclusion

All pupils receive quality first mathematics teaching and activities are differentiated accordingly, although all pupils are accessing the National Standard curriculum for their year group. Where pupils who are identified as needing targeted support, intervention programmes are planned and used.
Individual Provision Maps are developed and reviewed for pupils with SEND. These have specific targets and related actions to support pupils in accessing their year group curriculum to ensure that they are making expected and better than expected progress. (see SEND Policy).

The needs of pupils with English as an Additional Language will be met through planning with support from the Multicultural Support Agency where appropriate. This is supported by our (see Equal Opportunities Policy).

Pupils that are more able are planned for considering Mastery elements of the Mathematics Assessment Document.

The Pupil Premium Grant (PPG)

The Government believes that the Pupil Premium Grant, which is additional to main school funding, is the best way to address the current underlying inequalities between pupils eligible for free school meals (FSM) and their peers by ensuring funding is in place offer support to the pupils who need it most. These are the areas in which William Reynolds Primary and Nursery School will use the funding to address issues within mathematics:

- To close the gap for PPG and Non PPG pupils in mathematics
- All pupils in receipt of PPG receive good to outstanding quality of quality first teaching, pitched accurately with appropriate challenge so that they are working at national expectations
- Pupils in receipt of PPG are supported to overcome barriers to learning through our mathematics intervention programmes so that they achieve in line with other pupils
- The interventions are appropriate and flexible in order to close the gaps
- 1:1 support for progress in mathematics for pupils in care, at the edge of care and or working below national expectations
- To focus on developing pupil's in receipt of PPG who are higher achieving mathematicians
- To accelerate pupils' progress in order to close the gap in attainment compared to national expectations

(More information about PPG can be found on the school website).

Assessment, Recording and Reporting

Assessments are made in line with the school's Teaching, Learning and Assessment Policy.

Teachers use effective assessment for learning to ensure planning is based on prior attainment and that pupils know what they need to do to achieve the next steps. Group or individual curriculum targets are set accordingly. Marking is in line with the school's Marking and Feedback Policy.

Analysis of assessment data is used to set curriculum priority targets.

Pupils and parents are informed of these curriculum targets, at the beginning of each half term.

Pupils are involved in setting their own steps to success and encouraged to review their progress towards these through self, peer and teacher assessment.

Mathematics mats that map out their year group curriculum support pupils in knowing where they are in their learning and what they need to improve in order to reach national standard. Staff and pupils will use 'A Chance to Shine' for mathematics to assess work and set individual targets.

Teachers keep records that enable them to deliver an effective, creative and relevant curriculum that builds on prior attainment and meets the needs of pupils. Each term pupils from Year 1 to Year 6 will complete a Progress in Understanding Mathematics Assessment (PUMA) which produces a raw score, standardised score and a chronological age. This supports teachers with identifying gaps in the pupil's understanding and informs planning. The data from these tests is monitored to ensure pupils are making good or better progress in order to reach national standard.

Teachers assess at the each term using the schools; assessment without levels system (see Teaching, Learning and Assessment Policy and the Parents Assessment leaflet).

Resources

A comprehensive range of mathematical resources, including Numicom, are available in school. Every classroom has a good selection of mathematical equipment which is readily available for pupils to use.
Teacher resources are located in classrooms or in a specific mathematics resources area, located in Key Stage One.

Continuing Professional Development

Professional development for all staff is in place to support staff in keeping up to date with their own subject knowledge and use current materials that are available in school or online. Training needs are identified as a result of whole school monitoring and evaluation, performance management and through induction programmes. These will be reflected in the School Development Plan and termly Raising Attainment Plan.
The Mathematics subject leader offers staff relevant advice and information, such as feedback from courses as well as leading or organising school based training.

Monitoring and Evaluation

The Senior Leadership Team (SLT) including the Mathematics link governor monitors pupils' progress in Mathematics. Having identified priorities, the SLT and Subject Leader construct an action plan that forms part of the School Development Plan. This forms the basis for any monitoring activities and will clearly identify when, who and what is to be monitored and how this will take place e.g. classroom observation, planning scrutiny and book scrutiny (see School Monitoring Cycle).

Homework

Pupils are provided with weekly mathematics homework linked to the previous week's work they have covered in school. Sometimes, this homework may also be linked to mathematics curriculum targets or consolidation of times tables.

Pupils are provided with a password for an online mathematics program called 'Mathletics'. This resource provides the pupils with additional opportunities to learn and apply mathematical skills at home. It also encourages them to calculate fluently and rapidly. Pupils who do not have access to the internet at home are identified by class teachers and invited to attend homework clubs at school.

Appendices 1 - SMSC within Mathematics at William Reynolds Primary School and Nursery

Pupils' spiritual development is shown by their

- Ability to be reflective about their own beliefs, religious or otherwise, that inform their perspective on life and their interest in and respect for different people's faiths, feelings and values
- Sense of enjoyment and fascination in learning about themselves, others and the world around them
- Use of imagination and creativity in their learning
- Willingness to reflect on their experiences

Foundation Stage Year 1 Year 2 Year 3 Year 4 Year 5 Year 6	Throughout the years children develop reflective skills within Mathematics both during lessons and when carrying out self-assessments at the end of a lesson. Self-assessments are very important to enable pupils to have an accurate grasp of where they are and how they need to improve. In mathematics pupils are always encouraged to challenge their understanding of Mathematics and how it relates to the world around them. The skills of analysing data are taught from years 2-6 to enable children to make sense of the vast amounts of data available in the modern world around them. They develop a fascination about how currency can be used in their everyday lives. Also life skills such as telling the time, reading measurements and scales are taught in exciting contextual lessons. Children are given the choice in many lessons regarding the numbers or methods that they use. They are also able to choose their own problems and begin to create their own. Within Foundation stage children begin to explore shapes in the world around them and are able to talk creatively using mathematical language when constructing and describing models. Throughout Key Stage One the children explore mathematical patterns that occur in nature, such as the symmetry of snowflake patterns or the stripes of a Tiger. Lessons are planned carefully, linked to a theme to provide a context in which children have a purpose for learning. Children develop a fascination of Mathematics through a wide range of areas, such as number and place value, addition and subtraction, multiplication and division, fractions, decimals and percentages, geometry and statistics. In Key Stage Two, children continue to enjoy contextual mathematical lessons. Children investigate different number sequences and where they occur in the real world, such as Fibonacci pattern and algebraic formulas. Children begin to develop a fascination for number, in particular missing number problems. Mathematics is about thinking and describing, analysing and creating – it has changed the world. It can stimulate moments of awe and wonder as learners notice a connection or pattern for the first time. It encourages independence and the ability to make decisions based on evidence, reasoning and logic.

<table>
<tr><td colspan="2">Pupils' moral development is shown by their
Ability to recognise the difference between right and wrong readily apply this understanding in their own lives and, in so doing, respect the civil and criminal law of England
Understanding of the consequences of their behaviour and actions
Interest in investigating and offering reasoned views about moral and ethical issues, and being able to understand and appreciate the viewpoints of others on these issues</td></tr>
<tr><td>Foundation Stage
Year 1
Year 2
Year 3
Year 4
Year 5
Year 6</td><td>Within Mathematics children will recognise how logical reasoning can be used to consider the consequences of particular decisions and choices. Children explore a range of Mathematical investigations where they are challenged and made aware that there may be more than one solution. On the other hand, they are also aware that some problems require one correct answer.

A variety of lessons and closing the gap comments require children to prove or explain whether an answer is right or wrong. This helps the children to learn the value of mathematical truth. Mathematical reasoning is developed through guided group work where the children are encouraged to talk about their leaning and listen to other viewpoints.

Throughout all key stages children will look at moral issues raised from a question and will investigate, often using statistics to find an answer. Mathematical lessons are often linked to global charities, such as Children in Need and Comic Relief.</td></tr>
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<tr><td colspan="2">Pupils' social development is shown by their
Use a range of social skills in different contexts, including working and socialising with pupils from different religious, ethnic and socio-economic backgrounds
Willingness to participate in a variety of communities and social settings, including by volunteering, cooperating well with others and being able to resolve conflicts effectively
Acceptance and engagement with the fundamental British values of democracy, the rule of law, individual liberty and mutual respect and tolerance of those with different faiths and beliefs; the pupils develop and demonstrate skills and attitudes that will allow them to participate fully in and contribute positively to life in modern Britain</td></tr>
<tr><td>Foundation Stage
Year 1
Year 2
Year 3
Year 4
Year 5
Year 6</td><td>Problem solving skills and teamwork are fundamental to Mathematics, through creative thinking, discussion, explaining and presenting ideas. Throughout the key stages, children are provided with opportunities to work together productively on mathematical tasks and supported to see that the result is often better than any of them could achieve separately. Experimental and investigation work provides an ideal opportunity for children to work collaboratively.

Where available, selected children take part in gifted and talented mathematical workshops, within the community. Teachers also select groups of children to attend roadshow events which may be of benefit to their learning.

Socially, peer assessments are very important to enable pupils to have an opportunity to discuss and improve their work with others. Working together in pairs or groups and supporting others is a key part of Maths lessons.</td></tr>
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Pupils' cultural development is shown by their • Understanding and appreciation of the side range of cultural influences that have shaped their own heritage and that of others • Understanding and appreciation of the range of different cultures within school and further afield as an essential element of their preparation for life in modern Britain • Knowledge of Britain's democratic parliamentary system and its central role in shaping our history and values, and in continuing to develop Britain • Willingness to participate in and respond positively to artistic, sporting and cultural opportunities • Interest in exploring, improving understanding of and showing respect for different faiths and cultural diversity, and the extent to which they understand, accept, respect and celebrate diversity, as shown by their tolerance and attitudes towards different religious, ethnic and socio-economic groups in the local, national and global communities	
Foundation Stage Year 1 Year 2 Year 3 Year 4 Year 5 Year 6	Mathematics is a universal language with a wealth of cultural inputs throughout the ages. While developing their knowledge of place value, children begin to get a sense of number systems from around the world. Children recognise that mathematicians from many cultures have contributed to the development of modern day mathematics. Within Key Stage One and EYFS, children begin to understand the importance of counting and explore early counting ideas from other countries, such as tallies. Towards the end of Key Stage One, children explore the importance of zero as a place holder. In Key Stage Two, children begin to explore more developed number systems, such as Roman numerals, Egyptian Hieroglyphics and imperial and metric measurements. This supports the children to realise how our counting system has developed throughout the ages and shaped the decimal system that we use today. Strong curriculum links with history, allow the children the opportunity to explore calendars developed from different civilisations, such as the Mayans, Aztecs and Romans. Mathematics is explored through art when looking at symmetrical patterns, such as Rangoli. All children participate in an annual sports day where they are given opportunities to count and compare scores.