'Working and growing together'

Mathematics Policy		
Date	**Review Date**	**Subject Leader**
August 2020	**August 2021**	**Stephanie Crossley**

Introduction

At Fitzwilliam Primary School, we ensure we follow the aims from the National curriculum for Mathematics to ensure that all pupils:

- 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
- can 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.

Mathematics Curriculum Intent, Implementation and Impact Overview

The intent of our Mathematics curriculum is to deliver a curriculum which is accessible to all and that will maximise the outcomes for every child so that they know more, remember more and understand more. As a result of this they will:

- Make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems.
- Be able to apply their mathematical knowledge to science and other subjects.
- Realise that mathematics has been developed over centuries, providing the solution to some of history's most intriguing problems.
- Know that it is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment.
- Understand the world, have the ability to reason mathematically.
- Have an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

'Working and growing together'

School has identified key intentions that drive our Mathematics curriculum. At Fitzwilliam Primary School our Mathematics curriculum intentions are:

Intent	Research link	Implementation	Impact
Intention 1: **To build a Mathematicss curriculum which develops learning and results in the acquisition of knowledge and skills so that all pupils know more, remember more and understand more.** To design a curriculum with appropriate subject knowledge, skills and understanding in Number, Algebra, Ratio, Measurement, Geometry and Statistics as set out in the National Curriculum so that children can know more, remember more and understand more to help them reach and exceed their potential at Fitzwilliam Primary School and beyond.	**National Curriculum** School adheres to the statutory content of the National Curriculum to ensure all children have access to appropriate age related knowledge and skills **National Numeracy for Everyone- *KPMG. 2008. The Long Term Costs of Numeracy Difficulties. Every Child A Chance*.** Competency in numeracy is an important factor not only for the wider economy, but also for social justice and mobility. Numeracy issues are linked to reduced employment opportunities, increased health risks, higher rates of depression, increased risk of exclusion from school and increased risk of involvement in the criminal justice system. On the basis of existing data, KPMG estimated that low numeracy therefore costs the public purse £765 million per year when isolating the costs to those with only numeracy difficulties.	**National Curriculum Programmes of Study and Scheme of Work** • Mathematics is planned for, following the EYFS Framework and KS1 and KS2 school curriculum. • Mathematics is planned for following the scheme of work, as suggested by Maths Hub. • Whilst the National Curriculum forms the foundation of our curriculum, we make sure that children learn additional skills, knowledge and understanding and enhance our curriculum as and when necessary. • Mathematics is taught as an exclusive subject in order to promote fluency but children are also provided with real life problems so that they are made aware of the importance of mathematics in everyday life.	Children will make at least good progress in Mathematics from their last point of statutory assessment of from their starting point in Nursery. Children will use their Mathematics knowledge and skills, in all curriculum areas, to enable them to know more, remember more and understand more. Children will recognise the importance of Mathematics as a facilitating subject to enable them to access other areas of learning and operate successfully is everyday life both now and in the future.

Intention 2: **To build a curriculum, which enables** pupils to make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competency in solving increasingly sophisticated problems so that they **know more, remember more and understand more.** To design a curriculum which has mathematics at its core, is accessible to all and will maximise the development of every child's ability and academic achievement. We deliver lessons that are creative and engaging. We intend for our pupils to be able to apply their mathematical knowledge to science and other subjects. We want children to realise that mathematics has been developed over centuries, providing the solution to some of history's most intriguing problems. We want them to know that it is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. As our pupils progress, we intend for our pupils to be able to understand the world, have the ability to reason mathematically, have an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.	Numeracy and literacy difficulties however often co-occur - the combined cost is approximately £2.4 billion. Inversely, providing effective numeracy interventions at age 7 and reducing the number of pupils who currently leave primary school with very low numeracy, could produce an annual saving to the public purse of £1.6 billion. **OECD research indicates that** across all the variables they measure "good numeracy is the best protection against unemployment, low wages and poor health" **National Numeracy for Everyone** research indicates that maths and numeracy provide a route map to instilling a well-founded sense of self-belief. **School** baseline upon entry data indicates that a significant number of children enter Lower Foundation Stage with Mathematics skills that are below chronological expectations but the majority leave school in Year 6 reaching national expectations.	• The systematic teaching of number and place value has a high priority throughout school. • In Foundation Stage, pupil fluency is developed by using a visual, practical base to develop conceptual understanding and recall. Pupil's mathematical reasoning is developed through the use of concrete objects and spoken language to explain and justify. • School has developed a comprehensive Calculation Policy, which enables staff to teach standard methods systematically and progressively across all age groups. • **Maths Hub** is used as the spine for delivery of the Mathematics across school. Maths Hub ensures consistent coverage, and provides real life opportunities for pupils to make connections and apply their mathematical knowledge. • Daily **Target Maths** lessons provide opportunity for children to become fluent in the fundamentals of mathematics, thus increasing the likelihood of rapid progress. • Weekly **Problem Solving** sessions enable varied and frequent practice of mathematical application through increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. • The systematic teaching of **Timetables** ensures that children develop rapid recall which they can use as a tool to effectively and efficiently solve more complex problems. • Time limited **Intervention** is planned for those children who are working below their expected level of attainment and progress. • **A**ll children are expected to complete weekly mathematics **homework**. The mathematics homework focuses upon the four standard methods of addition, subtraction, multiplication and division so that children retain through regular practice the key operations required for them to successfully solve problems that are more complex. • All children have access to **Abacus Maths**, which is a web-based ability appropriate Mathematics programme, which they can access at home, and school. • All children from Year 2 upwards have access to **Timetables Rockstars**, which is a web-based ability appropriate timetables programme, which children access at home, and school.	Children will have a confident attitude towards mathematics. They will use arithmetic and timetables fluently and make connections in order to solve real life problems. They will recognise that Mathematics is essential for everyday life and make at least good progress in Mathematics from their last point of statutory assessment of from their starting point in Nursery. Children will use their Mathematics skills as a key tool in helping them to learn, and as a result, know more, remember more and understand more.
Intention 3:		• The promotion of mathematics is essential to the successful acquisition of knowledge across the curriculum.	Children will be able to produce written work in all

To provide opportunities across all curricular areas for the development and application of Mathematic skills to help all pupils know more, remember more and understand more. To design a wider curriculum that provides regular opportunities for pupils to use and apply the knowledge skills they have acquired from the Mathematics Curriculum.		• The promotion of opportunities to use and apply mathematical knowledge throughout school is planned in a variety of subjects set in real life contexts. • The promotion and implementation of outdoor learning and external cultural capital experiences provides additional opportunities for children to apply mathematical knowledge in real life situations.	areas of the curriculum of a similar standard which evidence good progress from their last point of statutory assessment point or their starting point in Nursery

Pedagogy

In Mathematics, like all other subjects, we recognise the importance of the methods and practice of teaching (the pedagogy) we choose to use in enabling pupils to know more, understand more and remember more. In Mathematics, the following approaches will be used, and be evident in pupil discussion, observations and work in books, in order to ensure that the learning opportunities and skill development are as effective as possible and that pupils progress throughout the year and across year groups during their maths experiences in school:

Teaching Sequence in Mathematics	Step 1 - 'The Big Picture' – setting the mathematics learning that is about to take place within the chronology of pupils maths learning and skill development to date. Starting with what the children know, understand, are able to do and able to say.	**Possible pedagogical approaches used in Mathematics**	**Behaviourism**	**Direct teacher instruction; modelling of skills and techniques; demonstration**
	Step 2 - Review most recent learning in mathematics.			
	Step 3 - Specify key vocabulary to be used and its meaning.		**Constructivism**	**Inquiry-based learning through skill development**
	Step 4 – Specify mathematical skills to be used.		**Social Constructivism**	**Teacher modelling; questioning; mix of individual, paired and group instruction**
	Step 5 - Provide opportunities for the children to work interactively		**Liberationism**	**Pupil-led learning; opportunities and skill development**

	Step 6 - Provide opportunities for children to critically review their own work and that of others. Step 7 - Individual reflection on the learning and mathematical skill development that has taken place.		**Learning, working and talking about mathematics with confidence**	**Being introduced to the key vocabulary and mathematical skills relating to mathematics so that all children can perform and compete using the correct skills.**

Curriculum Planning

At Fitzwilliam Primary School, we use the Maths Hub alongside Abacus to help us with the planning and delivering of Mathematics.
Our planning is set in two phases:
Long term plans - These plans map out the Maths units that will be covered in each half term for each year group. Each teacher is responsible for working out which units will fit where and ensuring that all units are covered. The Mathematics curriculum leader is responsible for the long term plan to ensure progression throughout each year group.

Short term plans- These plans list the specific learning objectives that will be covered in each lesson. These plans are monitored by the mathematics lead each half term.

Marking and Feedback in Mathematics

Marking of work is likely to look very different in the first few months of a school return at least. However, following improvements to our marking and feedback policies last year, we feel we are already in a strong position to ensure that children receive positive and constructive feedback that will move their learning and understanding forwards, even though the number of physically written comments in books and on work may be significantly less.

Where appropriate, children will self-differentiate their work and choose a suitable level to work at from a selection of options (Red, Amber, Green and Yellow Extension, where appropriate). They will be encouraged to move on in their work, when they feel ready, if they fully understand the work that they are doing. Moving on in their work may involve trying harder work or deepening their understanding.

Children will use traffic lights and comments to self-assess their own work and be encouraged to and guided on how to mark and comment on their own work.

Learning Environment

Teachers promote a stimulating and enriched learning environment where children feel safe to take risks, learn from their mistakes and understand that hard work and effort make a difference. In every classroom, we have a maths working wall which facilitates learning. Vocabulary and modelling of different methods are displayed on there. In order to further promote independence, staff provide resource scaffolds on the working wall so that the children can use them to support their learning.
In Foundation Stage, there is a Mathematics area that is set up by the class teacher and the children decide on which resources and tasks they would like to complete. They also have access to a maths computer programme.

Mathematics Resources

Each classroom will be resourced with materials to support the delivery of Maths; such items might include number lines, multiplication tables, 100 squares, 2D and 3D shapes, multilink cubes, Numicon, dice and other smaller items. Larger materials such as scales, trundle wheels and measuring cylinders will be held centrally in the store cupboard.

Children should be encouraged to use whatever resources are available to them in the classroom and which they feel would be beneficial to help them when completing Maths work.

Homework

FOUNDATION STAGE:
Children will receive weekly homework linked to the current focus.

KEY STAGE ONE / TWO:
Children will be provided with weekly maths homework, which will mainly focus on the standard methods and four operations. In KS1 there will be more of a focus on basic number and place value. If the children do not return their homework, they will be expected to complete it during Golden time on a Friday afternoon.

Reasonable Adjustments in Mathematics

As a curriculum leader in Mathematics, I recognise the importance to ensure that children with identified Special Educational Needs and/or Disabilities have access to an ambitious mathematics curriculum. Within the curriculum area of mathematics SEND children will be provided with reasonable adjustments through their tasks and level of challenge provided. Advice can be sought from the school's SENDCO where applicable.

Access for all

At Fitzwilliam Primary School we develop an inclusive curriculum through:

- Setting suitable learning challenges: It is the aim of the school that children should be given achievable learning targets, and be motivated by success. This may involve deepening children's mathematical skills and understanding, so that all children's learning needs are catered for, and pupils achieve as high a standard as possible.
- Responding to pupils' diverse learning needs: Mathematics at Fitzwilliam is planned so that all pupils can take part in lessons fully and effectively so that there is an equality of opportunity through teaching approaches.

Mathematics at Fitzwilliam is planned so that potential barriers to learning and assessment for individuals and groups of pupils are overcome. This is achieved through:

- Provision being made where necessary to support individuals or groups of pupils to enable them to participate effectively in mathematics lessons.
- Pupils' understanding being developed through the use of all available senses and experiences.
- Aspects of the programmes of study that may present specific difficulties for individuals being identified.
- An inclusive mathematics curriculum is also achieved through:
- Support to access texts (e.g. audio or larger print).
- The use of alternative communication methods e.g. ICT or speech.

In assessment, judgements allow for the provision described above.

Assessment in Mathematics

Children will be assessed in maths rigorously throughout the year.

- Foundation Stage make assessments which are ongoing throughout the year;
- Upper Foundation Stage complete statutory Early Years Foundation Stage Profiles during Summer 1.
- In KS1 and KS2, pupils will complete maths assessments at the end of each term. These will inform the next steps of learning and allow Target Tracker to be updated at key points against ARE.
- Year 2 and Year 6 will complete the statutory maths test in Summer 1, as well as similar assessments throughout the year.
- Teacher assessment of maths is completed using a range of evidence from maths sessions and target maths and judgements are made and recorded on Target Tracker at key, agreed times.

Organisation of Teaching

Children at Fitzwilliam Primary School are given the widest possible range of mathematical experiences including practical, investigative and problem solving exercises. Mathematics is taught daily in KS1 and KS2. We ensure Quality First teaching is consistent across school so that all pupils make at least good progress. Kagan strategies and structures are used throughout school to ensure that active learning is taking place in the class. Teachers will also plan for outdoor learning opportunities throughout school so that they can apply their mathematical skills outdoors.

Every week, children from Years 2 to 6 complete a weekly arithmetic test so that staff are able to measure their ability to perform basic **arithmetic** operations and to solve problems that involve fundamental **arithmetic** concepts. The aim is to get children used to completing weekly tests under timed conditions so that they develop quick mathematical skills to help them solve more complex problems.

Areas of Provision

In Year 1, provision is linked to their current theme topic where children are able to apply their mathematical skills in these areas throughout the year.

Upper Foundation Stage

In Upper Foundation Stage, Mathematics is taught four times a week where one lesson is spread over 2 days.
Mathematics is taught on a Monday and Tuesday afternoon and is set up like a carousel where the same lesson is taught over the two afternoons.
During these afternoons, children are split into the following groups:
Group 1- In the provision Area
Group 2- Applying Mathematics outside
Group 3- Working with the class teacher
Group 4- Completing an independent task

By Tuesday afternoon, the class teacher will have worked with all four groups.

Mathematics in also taught on a **Wednesday afternoon** where the children will apply mathematics in areas of provision. The class will be split into two groups where one group will go outside and the other group will stay inside. The following week, the two groups will swap and one piece of evidence for each child will be collected by the class teacher over the two weeks.

Mathematics is also taught on a **Thursday morning.** This is where the class teacher will work with focus groups.

Lower Foundation Stage

Maths is accessed through areas of provision with planned focused weeks.

Key Stage 2

Children in KS2 complete target maths 15 minutes every day after lunch. This is so they can consolidate what they have learnt previously in lessons and the teacher is able to address any misconceptions. They also have the opportunity to apply their mathematics to a variety of problems.
Children also complete weekly times table tests in order to provide opportunities for weekly times tables practice and boost times table recall speed.

Links to Spiritual, Moral, Social and Cultural Development

Links to Spiritual, Moral, Social and Cultural Development

At Fitzwilliam Primary School, childrens' **spiritual** development is enhanced through Mathematics by:

- Understanding how Mathematics relates to the world around them
- The skills of analysing data enables children to make sense of the vast amounts of data available in the modern world and around them
- Develop a fascination about how currency can be used in everyday lives
- Learning life skills such as telling the time, reading measurements and scales are taught in exciting contextual lessons
- Explore shapes in the world around them and talk creatively using mathematical language

At Fitzwilliam Primary School, childrens' **moral** development is enhanced through Mathematics by:

- Recognise how logical reasoning can be used to consider the consequences of particular decisions and choices
- Explore a range of mathematical investigations where they are challenged and made aware that there may be more than one solution
- Proving or explaining whether an answer is right or wrong. This helps them learn the value of mathematical truth
- Mathematical reasoning can be developed by group work where the children are encouraged to talk about their learning and listen to others viewpoints
- Look at moral issues raised from a question and will investigate, often using statistics to find an answer

At Fitzwilliam Primary School, childrens' **social** development is enhanced through Mathematics by:

- Problem solving skills and teamwork through creative thinking, discussion, explaining and presenting ideas
- Work together productively on mathematical tasks
- Experimental and investigation work where children are encouraged to work collaboratively
- Work collaboratively when completing outdoor learning tasks

At Fitzwilliam Primary School, childrens' **cultural** development is enhanced through Mathematics by:

- Begin to get a sense of number systems around the world
- Recognise that mathematicians from many cultures have contributed to the development of modern day mathematics
- Counting and explore early counting ideas from other countries such as tallies
- Explore more developed number systems such as Roman numerals, imperial and metric measurements
- Realise how the counting system has developed through the ages and shaped the decimal system we use today

Staff Development

Over the course of the academic year the mathematics subject leader monitors and evaluates:

- The attainment and progress of pupils in Maths
- The pupils response and attitude to Maths
- The quality of Maths teaching in school
- The quality of children's work in Maths

This is achieved through:

- Classroom observation of Maths, including learning walks, with written feed back
- Questioning of children during these observations
- Discussions with pupils
- Carrying out regular scrutiny of work, and feeding this scrutiny back to teachers.
- Looking at Maths displays in classrooms and corridors.
- Monitoring each teacher's Maths planning every term, as appropriate, and providing written feedback.
- Keeping all staff informed on changes that effect Maths in school.
- Attending any Maths Subject Leader meetings arranged by the MAT, LA or other providers.

Subject Development

Subject Development

The Maths leader will:

- Ensure the subject of Maths meets statutory requirements of the national curriculum.
- Continue to monitor the implementation of the Maths scheme of work and history policy documents.
- Continue to monitor staff development in Maths, through classroom observations if appropriate, staff questionnaires, monitoring and feeding back on medium term planning and children's work.
- Attend appropriate courses, if available, to develop personal knowledge and expertise, and to share this in school.
- Complete pupil discussions with pupils from a range of classes, on how Maths is delivered in our school.
- Maintain the Maths course on the school VLE, for staff and for children.
- Maintain the Maths section of the school website for all stakeholders.
- Monitor and evaluate the quality of Maths resources in school, and bring in new resources as appropriate.

E-Safeguarding

The maths policy and SOW adheres to the whole school E-safeguarding policy

Equal Opportunities

Mathematics follow the schools Equality policy

Review

This policy is a live document, being constantly updated.

This Policy was last updated in August 2020, by Stephanie Crossley