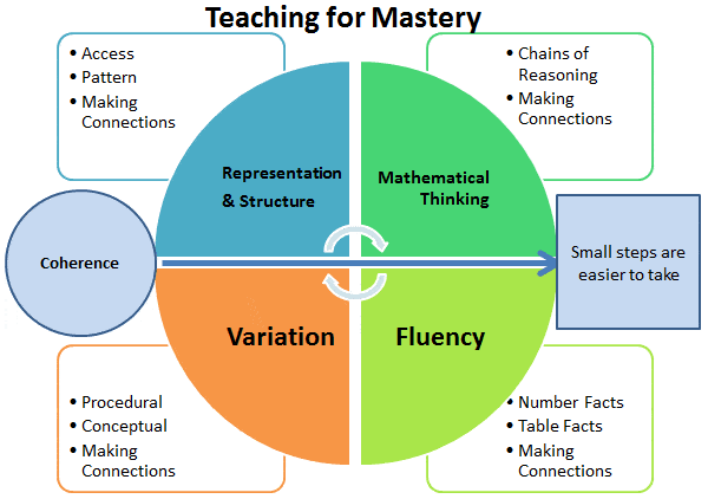
Mathematics POLICY

INTENT

At Greenfield Primary School we use a teaching for mastery approach. Maths teaching for mastery supports the idea that everyone can do maths, we deepen children's understanding and aim for all children to master skills before moving on. All pupils are encouraged by the belief that by working hard at maths they can succeed.



- The expectation is that most pupils will move through the programmes of study at broadly the same pace.
- 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, including through additional practice, before moving on.
- Teachers believe in the importance of mathematics and that the vast majority of children can succeed in learning mathematics in line with national expectations.
- The reasoning behind mathematical processes is emphasised. Teacher/pupil interaction explores how answers were obtained as well as why the method worked and what might be the most efficient strategy. We value 'mathematical talk' and children get lots of opportunity to talk about and evaluate their mathematics during lessons, comparing their strategies with those of others.
- Concrete and pictorial resources are used extensively throughout teaching. This helps to present and understand the mathematics in ways that promote deep, sustainable learning

At Greenfield Primary School we aim for our children to:

- 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
- 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 nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

IMPLEMENTATION

At Greenfield Primary School we have chosen to follow the White Rose scheme of work to structure and support our long-term planning. This scheme enables teachers to plan through a number of small steps to ensure consistency, consolidation and continuity throughout the school. It gives teachers and pupils a wealth of opportunities to use and apply their mathematical skills in

a variety of problems and contexts. Although this scheme covers the National curriculum effectively, we also understand the need to give our children experiences beyond a single maths scheme. We therefore supplement our maths curriculum with a number of other resources, activities and opportunities. These include the following:

- Key maths resources and equipment accessible at all times to all children, these include but are not limited to tens frames, counters, place value grids, base 10 equipment, 100 squares and multiplication lists
- Daily fluent in five sessions to revise, consolidate and practise key arithmetic skills
- Daily reasoning problems to recap and revise previous learning/topics
- Maths games or apps to revise, recap, rehearse and develop rapid recall of key number facts e.g. Times Table Rockstars, Maths Shed, Hit the Button.
- Access to problems and questions from other resources outside of White Rose
- Looking at and using maths across the curriculum, for example how number systems looked in the past, representing science data in tables and charts and how we use maths in art and DT.

Teaching Time

Reception classes follow the mastering number programme to teach and understand the concepts of number. Daily sessions using this programme take place and are supplemented through continuous provision activities. White Rose is used to teach other areas of maths such as shape.

Children in Key Stage 1 have daily maths lessons which use White Rose as their base. They also deliver a separate 10-15minute mastering number session 4 times a week.

Children in Key stage 2 follow the White Rose scheme for at least 4 sessions a week, supplementing it where needed. They also complete daily arithmetic practice (fluent in five) and a daily reasoning problem. They are given regular opportunities to practice times tables outside of the maths lessons using TT Rockstars both at school and at home.

Curriculum Planning
The Maths Coordinator will produce/provide maths progression maps (White Rose) to enable staff to plan the curriculum. Staff will produce medium term plans which are monitored by the Head Teacher and Coordinator. Short term planning will be carried out by the class teacher using the White Rose scheme and adapted where class teachers see a need. Short term planning should be for the class teacher to effectively deliver the lesson and may take a variety of formats. The Coordinator and the SENCO will provide support for planning whenever this is necessary.

Long term planning
The National Curriculum for Mathematics 2014, Birth to 5 Matters 2021 and the Early Learning Goals (Number, Numerical Patterns) provide the long-term planning for mathematics taught in the school.

Medium term planning
Reception – Mastering Number programme
Year 1- Year 6 teachers use the White Rose schemes of learning to create a medium-term plan for each half term.

Short term planning
Lessons are planned using the White Rose small steps. Teachers adapt the lesson plans provided to suit the needs and their children and supplement them with any additional resources. Children are expected to title each day's maths work. These titles will be used to discuss each day's WALT (what are we learning today).

Lesson Structure
Children are mostly taught in mixed ability groups and all children will access the same teaching input (children with specific needs may be taught 1:1 or in a small group when necessary). Seating in classrooms is mainly mixed ability but children may be moved to support interventions during lessons.

We base our planning on White Rose in years 1-6 and use the lesson structure outlined by this scheme but adapt and supplement the resources to suit the needs of the learner. Lessons follow the CONCRETE-PICTORAL-ABSTRACT approach. Children, especially in years Reception to Year 3 should develop a secure grasp of maths topics using concrete and pictorial representations before moving onto the abstract phase.

Concrete representation: The children are first introduced to an idea or a skill by acting it out with real objects. This is a 'hands on' approach using real objects and it is the basis for conceptual understanding. Concrete apparatus such as Numicon, double sided counters, base 10 apparatus and place value counters are used widely across school.

Pictorial representation: This is used when a child has sufficiently understood the hands-on experiences performed and can now relate them to representations, such as a diagram or picture of the problem.

Abstract representation: The symbolic stage – children are now capable of representing problems by using mathematical notation, for example: 12 ÷ 6 = 2. This is often the more confusing of the three and without the 'hands on' and pictorial steps can be tricky for some children to understand.

Each lesson begins with teacher input often involving exploration through concrete apparatus or pictorial representation. Pupils understanding will then be consolidated or extended through appropriate whole class/paired work tasks before children are ready to complete independent practice which may require them to use a more abstract way of working. Children who grasp concepts quickly will be given opportunities to deepen and apply their learning though a variety of resources such as NCETM, Twinkl mastery or ENRICH tasks.

Homework

The daily maths lesson will be extended by out of school activities or homework. This may take a variety of forms:

- a mental task such as learning number bonds or tables facts
- further practice of a skill or method taught in a lesson
- a practical activity that the children can carry out at home.

These activities will be relevant to and drawn from the work the children have done in school. Children will be asked to regularly use maths apps such as TT Rockstars, White Rose 1 minute maths, Hit the Button and Maths Shed to consolidate learning alongside some paper based activities.

Links between Maths and other subjects

Links will be made wherever possible to other subjects in the curriculum so that children get an idea of how maths can contribute to many areas and ensure that it is not seen in isolation.

School and Class Organisation inc. **Children with Special Educational Needs**

All pupils are to have access to the Maths Curriculum regardless of ability, race, gender, cultural background or any physical or sensory disability in line with the DDA 2005.

For the vast majority of pupils they will be taught in their classroom by their class teacher, following the White Rose scheme appropriate for their age/year group.

In the case of physical or sensory disability, the school will endeavour to provide specialist apparatus or computer software to enable every child to have full access.

SEND: The teachers will consult the SENCO whenever they have concerns about a child's progress in Maths. The SENCO may decide to carry out specific assessments and if necessary place the child on the SEND register or consult outside agencies for further advice and support. As teachers it is important to realise that a child with a difficulty in reading may be able in maths and ensure that difficulties in reading do not hinder mathematical progress. It is important to ensure that resources allow all children to show their mathematical knowledge and ability and that those children with reading or recording difficulties are not prejudiced. How we cater for children of differing abilities

All children benefit from being included in the oral elements of a lesson and watching and listening to other children explain their methods and reasoning and demonstrating their methods. Where pupils have severe difficulties however, they may need to work with a teaching assistant or support teacher for most of their maths work. In each year group, certain children may also be part of a short Maths intervention session at other times of the day. This may just be a single session to go over a particular lesson with a child/children or it may be a series of sessions to support a small group of children. All children will be challenged during Maths lessons. However, more able children may be given further activities to do which deepens their Mathematical understanding once they have shown they have mastered a skill.

Foundation Stage: Pupils are assessed against the Early Learning Goals (ELG) at the end of their academic year in Reception. The Mathematics ELG's are Number and Numerical Pattern. Pupils are assessed as either ELG emerging or expected. Mathematical understanding is developed through stories, songs, games, imaginative play as well as more formal teaching methods using the Mastering Number programme. Mathematical vocabulary is modelled during the daily routines and throughout adult led activities. There is an effective balance of adult led learning experiences and opportunities for the children to initiate and develop their own mathematical learning through continuous provision. Mathematics is embedded within and supports all the 7 areas of learning in the foundation stage.

Information Technology (IT)

Wherever possible IT will be used to support teaching and to motivate and improve children's learning. IT will include the use of iPads by the pupils, it may also include the use of calculators especially in years 5 and 6. Children will have the opportunity to use the iPads as often as possible to practise their individual skills and improve their computing capability. The school has an annual subscription to TimesTables Rockstars (TTRS) and Maths Shed. These are sites which combine teaching materials for use in class with practice tasks for children which can be set as homework or completed as part of the Maths lesson. The school takes part in a number of interclass and interschool challenges organised by TTRS.

Calculator use does not form part of the New Curriculum and their use is not recommended for children prior to entering years 5 and 6. However, teachers may wish to use them to enable children to handle more complex numbers or problems especially when using maths in other subjects such as calculating average rainfall in Geography.

Practical Maths Resources

The Maths coordinator is responsible for ordering and maintaining resources throughout the school in liaison with individual class teachers. Key resources (base ten, counters, multi-link) are

mainly kept in classes with the majority of larger or topic-based items being shared across the school (this may sometimes lead to the orer units are taught being slightly changed).

Assessment

Assessment will take place at three levels: • short-term • medium-term • long-term.
These assessments will be used to inform teaching and future planning.

Short-term assessments: This mainly involves informal assessment during lessons to check children's understanding and marking (see maths marking guidelines). This includes, self, peer and live marking as well as lots of opportunities for 'show me' work on individual white boards.

Medium-term assessments: There should be regular opportunities planned to assess the children's understanding of the objectives covered. This should relate to the children's targets (see below) as well as their performance against age related expectations

Long-term assessments: These are more formal assessments which take place at the end of each term to review and record pupil's progress.
• Foundation Stage Assessments (Sept and June)
• Formal testing by teachers in Years 3-5 once a term. This is currently done using the NFER test materials
• Past National Key Stage One Tests are currently used in for Year 2 at the end of each term.
• Year 1 are assessed termly against key maths facts.
• In ear 6 National Key Stage Two Tests are sat in May, with regular mock SATs tests taking place throughout the year to ensure children are familiar with the format and timings.

Results from these are analysed by the Head Teacher, Maths Coordinator, SENCO and Pupil Premium Lead to set targets for the forthcoming year/term.

Where ever possible, the children should be involved in their own assessment so that they are aware of the progress that they are making. SEN children will have specific targets relating to their targets set during their PCR meetings.

Work Scrutiny and pupil voice
Each term every class teacher will provide a set of maths workbooks for scrutiny. These will include work from each level of ability within that class. The work scrutiny will be undertaken by the Coordinator, and may, on occasion, include other members of staff. Feedback resulting from this will be given back to staff.
Pupil interviews will take place with a range of pupils across different year groups and abilities. This will be used to inform planning and feedback given staff.
Lesson observations will be carried out by the Head Teacher and SLT and feedback form these observations will be used to provide curriculum development for staff.
The governing body will also carry out a monitoring visit on an annual basis to look at the teaching of Maths across the school.

IMPACT

Children at Greenfield Primary School know that maths is a vital life-skill that they will rely on in many areas of their daily life. Our children have a positive view of maths due to learning in an environment where maths is promoted as being an exciting and enjoyable subject in which they can investigate and ask questions; they know that it is reasonable to make mistakes because this can strengthen their learning through the journey to finding an answer. Our children are confident to 'have a go' and choose the equipment they need to help them to learn along with the strategies they think are best suited to each problem. By the end of Year 6, when transitioning to secondary

school, pupils at Greenfield Primary School will have developed a bank of efficient and accurate skills that can be used to calculate effectively. These will have been underpinned by the C-P-A approach so that children understand maths rather than just do it, which ultimately will allow children to identify when answers do not make mathematical sense. Children will be able to apply these calculation skills and understanding of other areas to become confident and resilient problem-solvers with the ability to reason and articulate their ideas mathematically. Children will have the language to be able to justify, reason and explain their answers.