Rationale for Mathematics

Intent

At Lacewood Primary School, our intent is to promote an enjoyment of mathematics in a variety of different ways, including: through practical opportunities to explore mathematical concepts, as well as through exploration and discussion. This helps the children to become fluent in the fundamentals of mathematics from an early age. Our aim is to develop pupils' mathematical fluency and confidence, to enable them to solve a range of problems and articulate answers in a concise and logical manner, across the curriculum and in everyday life. Each mathematics lesson will challenge every child, regardless of their ability.

We encourage the children to be active participants in maths lessons, in which they work both collaboratively and independently. We believe in creating an environment where children feel comfortable to share their thinking, question one another, to agree or disagree, and justify their decisions. Calculations and concepts are represented in different ways moving from concrete representations where children can build their understanding using equipment and manipulatives, to visual representations, before moving on to abstract representations.

Our aim is for pupils at Lacewood Primary School to display positive attitudes towards mathematics and embrace mathematical challenges, to not shy away from failure, make mistakes and take risks. This also extends to how mathematics can be used within other areas of curriculum through rich cross-curricular links.

Relentless efforts are taken to improve, push and challenge the outcomes for all children, achieving and fulfilling their potential whilst reaching the intentions of the National Curriculum. Staff are aware that depth of knowledge underpins all skills.

Staff have the highest expectations in the teaching of Mathematics and our aims are for children to:

- Have a positive attitude towards mathematics.
- Have self-confidence in their ability to deal with mathematics.
- Be able to work systematically, co-operatively and with perseverance.
- Be able to think logically and independently.
- Experience a sense of achievement regardless of age or ability.
- Understand the appropriate underlying skills, concepts and knowledge of number, measurement, shape, space and handling data.
- Be able to apply previously acquired concepts, skills, knowledge and understanding to new situations both in and out of school.
- Use mental calculations and choose and efficient strategies to work out the answers.
- Understand and appreciate pattern and relationship in mathematics.
- Be able to communicate with peers and adults, ideas, experiences, questions, clearly and fluently, using the appropriate mathematical language.
- Be able to explore problems using the appropriate strategies, predictions and deductions.
- Have equality of opportunity regardless of race, gender, or ability.
- Be aware of the uses of mathematics beyond the classroom.

Implementation

At Lacewood Primary School, we follow the National Curriculum and use year group planning and resources from White Rose Maths to support the delivery of mathematics throughout the whole school. Within each of the math's learning sequences our children will experience:

- Real life problem solving and investigation.
- Taking risks and learning from mistakes.
- Opportunities to prove and explain ideas.
- Opportunities to build resilience and encouragement to self-challenge in their learning.
- Deep levels of questioning and reasoning.
- Peer support through discussion.

What does mastery in mathematics look like at Lacewood Primary School?

Teaching is underpinned by knowledge of developmental progressions, detailed in our number and non-number tracking documents. All year groups follow the White Rose Mastery Framework to ensure a consistent learning approach towards mastery runs throughout the school, to ensure a smooth transition between each sequence, therefore providing a coherent journey and consistent challenge for our children. Teachers are expected to use their professional judgement when following this scheme. This may involve spending more time on a given area than suggested on the planning, or choosing an alternative representation to teach a concept. Concepts are taught in depth, with adequate time spent on each area before moving on. Our number and non-number progression trackers, created from the National Curriculum and NCETM's progression documents, inform teachers of the expectations of each year group.

Additionally, to gain a mastery understanding in each sequence, we focus on three main areas: fluency **(Learn it!)** problem solving **(Use it!),** and reasoning **(Solve it!).** These areas will be evident throughout each teaching sequence, in the following ways:

Fluency (Learn it!): We incorporate fluency practice, both within math's lessons, as well as throughout the day by using retrieval activities (eg: Flashback 4), Times table sticks and Time Table Rock Stars.

Problem Solving (Use it!): Children are given opportunities to solve practical, illustrated or abstract problems throughout each sequence.

Reasoning (Solve it!): Reasoning forms a key part of every mathematics session. This gives pupils a chance to discuss the patterns and links to previous learning, and to understand other pupils' interpretations.

All children are encouraged to be active participants in mathematics lessons and discussions. Their opinions are always valued and therefore they feel comfortable to share ideas, even if they are uncertain.

Learning is differentiated through the use of our progression documents to ensure appropriate levels of challenge and to ensure high expectations of all children, including those with Special Educational Needs (SEN), those from disadvantaged backgrounds and those working at a greater depth level.

Assessments are carefully analysed and used to inform planning and identify those who require targeted interventions. Interventions are also used for children on track to be greater depth mathematicians, not just those who find Maths a tricky subject.

Mathematics within the classroom environment

All classrooms within the school place high value on mathematics. Every classroom has a learning wall dedicated to mathematics; these display items to support, develop and challenge pupils within the sequence of learning. They are designed to act as an aide memoire for children that the children access independently. These learning displays mirror the key parts of a lesson structure: flashbacks to prior learning that may support them as they move through the sequence, key vocabulary, a variety of representations of concepts being explored and key questions to promote deeper thinking. Children are also encouraged to be resourceful and have access to a wide range of resources and supportive materials and equipment, which promotes independent learning.

EYFS

In FS2, the children have one 25-minute Numeracy lesson each day covering White Rose steps. We use 'Master the Curriculum' which follows the White Rose Maths scheme. Frequent and varied activities and opportunities are provided for children to build and apply this understanding using concrete materials. All children in EYFS use provision inside and outside, to notice, explore and experiment with patterns and shape. They also explore number and pattern through Number Fun songs and dances throughout the week.

Key Stage 1

In Year 1, the children have one 45-minute numeracy lesson each day and they cover one White Rose step each week. When suitable, steps are combined to ensure that all steps are taught during each half term. A carousel approach is followed in numeracy and the children have the opportunity to build upon their learning and knowledge by working through the carousel each day of the week. Each week, they complete all of 4 numeracy activities and have one opportunity to access our continuous provision. These activities include the White Rose Maths worksheet, a practical activity using concrete resources and manipulatives (10 frames, counters, cubes, base 10 sets, Numicon etc), a number formation and 1:1 counting practise activity enabling independent use of the resources in the numeracy area of provision. The activities are differentiated for the children so that they can access their learning and are appropriately challenged. The children have the opportunity to use manipulatives each week, both supported by an adult and independently. This allows them to explore representations of number and to further develop their understanding. They also explore number through Number Fun songs and dances each half term. This builds upon their learning in FS2.

In Year 2, the children have one 45-minute Numeracy lesson each day. The class teacher shares the White Rose slides along with demonstrations of concrete resources and pictorial information when appropriate. The teacher ensures that the children know what they need to do for each section of the worksheet through short whiteboard activities before sending them to complete it independently at their tables. The less able children are supported and have concrete resources available to allow them to solve more abstract problems and questions. Lessons are differentiated using mild, spicy and hot activities and children have the opportunity to challenge themselves throughout the week. The teacher stops the children periodically when applicable to check pupil understanding. When pupils indicate a good level of understanding, the class teacher encourages them to challenge themselves by completing the 'hot' challenge. The Year 2 children do a Table's

Stick activity three times a week to embed knowledge of the 2, 5 and 10 times table. They progress onto the 3 times table towards the Summer term.

Key Stage 2

In Key Stage 2, teachers use the White Rose Maths Scheme of Learning as a guide to plan and deliver their lessons. Children will begin the lesson with a 5-10 minute starter activity which may consist of retrieval practise based on prior learning from recent lessons or previous years that link to the upcoming lesson e.g.: Flashback 4, Or have a Times Table focus. Once live marking and any misconceptions from the starter activity have been completed, the delivery of the new 'small step' will begin. Sometimes, this will begin with a 'True or False' statement to engage children and spark discussion. Teachers will then lead an interactive teaching sequence, where the new 'small step' is introduced. Teachers will do this through using a concrete, pictorial and abstract approach where deep-thinking questions will enable children to link prior learning to ensure fluency is achieved with opportunity to access problem-solving and reasoning questions. Children will use whiteboards or other appropriate manipulatives to answer questions, enabling teachers to formatively assess within the lesson in order to appropriately allocate further support through teaching assistants. Once the new concept has been taught, children will have the opportunity to practise their fluency through 'learn it' questions, which is designed to embed the new learning. Live marking will take place within the lesson, so that teachers can address any misconceptions and children can feel confident with their understanding. Children are then given the opportunity to access 'use it' and 'solve it' questions to 'master' their understanding and apply the fluency they have gained through the 'learn it' section.

Impact

The impact of our mathematics curriculum is measured through careful monitoring of pupil progress and attainment throughout each school year, and for every year group.
Progression of children's mathematics is constantly monitored through the following ways:

- Application tasks at the end of a sequence of learning which enables teachers to monitor small steps progress within a particular area of mathematics.
- Verbal discussions with children.
- Formative assessment in daily lessons.
- Termly assessment.
- Teacher judgements.

The impact of the mathematics curriculum is further monitored by our subject leaders through the use of monitoring practices, such as pupil voice and book scrutiny. The findings from monitoring help to inform subject action plans in order to ensure a strong model of subject development based on current research and pedagogy.