Sleights Church of England
(Voluntary Controlled) Primary School

Mathematics Policy

February 2022

*This policy was reviewed in February 2022, following careful consideration of the mathematics research review, Covid-19 and it's implication on the curriculum delivery.

Working together to be happy; to flourish; to succeed
through our Christian values
perseverance, respect and **trust.**

Mathematics at Sleights

"The only way to learn mathematics is to do mathematics"

Paul Halmos, Mathematician

At Sleights, mathematics will provide children with practical, hands on learning opportunities to support their development and understanding of facts, methods and strategies. Based on curriculum principles of effective Early Years practice, maths at Sleights encourages children to think creatively, play, explore and problem solve.

About this policy

This policy intends to outline the policy and procedure for teaching and learning in mathematics at Sleights Church of England (Voluntary Controlled) Primary School.

In our Church school, our vision is to "work together to be happy; to flourish; to succeed". This policy intends to outline how our whole school community lives this out in relation to curriculum planning and learning in relation to mathematics. Our Christian Values are firmly rooted in this policy. This information is created from staff discussion, ideas and feedback.

Christian Value	How is this value lived out in our mathematics policy?
Perseverance	*I can do all things through Christ who strengthens me* (Philippians 4.13) At Sleights we believe that one of the most important factors in successful child centred learning is perseverance. For children to be competent mathematicians, they must be willing to grapple through mistakes, take risks in their learning and try again when things don't work out. As mathematicians, we want our children to be able to try different paths to a solution, learn from their mistakes and develop a 'have a go' attitude. We are there to support our pupils as they persevere through a proactive struggle by directing them through mathematical schemes of work, encouraging mathematical discussion and completing shared work with teaching staff and peers. We offer daily reasoning and problem solving challenges which encourage children to develop skills of mathematical thinking and enquiry.
Respect	*So in everything, do to others what you would have them do to you* (Matthew 7:12) All children should be educated with dignity and respect and respectful teaching staff provide opportunities for mathematical decision-making through knowing each individual child, how they learn and being aware of their learning needs. This, in turn, allows us to guide their next learning steps. It is important that we know when to offer help and assistance whilst also respecting a child's wish to explain their thinking. Shared discussions, useful feedback and commenting positively on their answers encourages successful and confident mathematicians.
Trust	*My God is my strength in whom I trust* (Psalm 18:2) Our children are encouraged to trust one another, work as a team with their peers, class and school family resulting in pupils who are positive and confident in their mathematical learning. We all grow through consistent experiences of reliability and integrity. We care about each other, showing kindness, gentleness, honesty and support.

Rationale

The purpose of mathematics at Sleights Church of England (Voluntary Controlled) Primary School is to equip the children with the knowledge, skills and understanding to become confident mathematical problem solvers.

Children are taught to think and reason mathematically, apply skills fluently and efficiently, and arrive at an accurate answer. Mathematics learning at Sleights Church of England (Voluntary Controlled) Primary School is well sequenced, progressive and focused on developing core mathematical concepts.

At Sleights, we follow the 'White Rose Hub' Schemes of Learning across school. Our children experience opportunities for regular fluency, reasoning and problem solving tasks. These tasks are completed when exploring the entire mathematics curriculum, organised into a progressive long term plan over the children's time at Sleights, supported by the non-statutory 'Ready to Progress' criteria (identified in White Rose Hub as 'Small Steps).

Mathematics at Sleighs involves:

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Practical opportunities to develop mastery in mathematics through fluency, reasoning and problem solving tasks.	Daily Key Skills teaching, focused on building, revising and securing the foundation skills in mathematics.	Times tables practise, through Key Skills work, focused on improving speed and accuracy of instant recall facts.	Children identifying their own level of challenge, based on the skills and understanding they have already gained.

Intent of our mathematics curriculum

The children at Sleights will be provided with a mathematics curriculum offer designed to:

- build on and develop core mathematical concepts in a well sequenced and structured progression across their time at Sleights.
- support children's acquisition and progressive understanding of declarative, conceptual and procedural mathematical knowledge.
- enable children to become fluent in the fundamentals of mathematics.
- equip children to develop conceptual understanding recall and apply.
- provide opportunities for frequent and varied practise of reasoning and problem solving.
- allow children to gain and use a range of transferable key skills both in mathematics and across the full curriculum.
- offer opportunities for explicit teaching of problem solving activities.
- in line with our Growth Mindset philosophy, develop independent learners, who are confident and inquisitive to tackle mathematical problems.

We believe that every child is a mathematician and, as a school, we must support and equip all children with mathematical success.

Implementation: Our approach to teaching and learning

Progression of skills and understanding is vital in the successful implementation of our mathematics curriculum. In order for children to progress, they need to have a firm understanding of facts (**declarative** knowledge), before developing methods (**procedural** knowledge) and implementing strategies (**conceptual** knowledge). Teachers ensure that children's understanding of facts is secure, before developing and building on understanding of methods and strategies.

As a school, we recognise the importance of problem solving in mathematics and, therefore, children are provided with explicit opportunities for gaining these skills and knowledge.

We have adopted a number of school wide systems to support the effective implementation of mathematics at Sleights, including consistent Schemes of Learning, progressive approaches to calculation, manipulative use and presentation in books.

Implementation: Our Schemes of Learning

The statutory programmes of study from the National Curriculum are taught through the school's adopted 'White Rose Hub' Scheme of Learning. Clear progression of skills and concepts is identified with the scheme across Early Years, Key Stage One and Key Stage Two. In addition to the White Rose Hub programmes for Reception, our school has established its own bespoke curriculum, based on the secure understanding and knowledge of the expectations of mathematicians in the Early Years and beyond.

Using White Rose Hub materials, including 'Small Steps' (based on Ready to Progress Criteria), mathematics lessons at Sleights focus on learning facts, methods and strategies, which have been broken down into small steps. This ensures children deepen their knowledge and understanding of core concepts. The exploration of the types of mathematical knowledge (declarative/facts, procedural/methods and conditional/strategies) is made explicit to the children in teaching and learning.

A full copy of the school's long term plan can be found on our website. This is reviewed annually, to ensure effective coverage and sequencing of learning, based on mixed age and single year group classes.

The White Rose Hub termly block plans break down the national curriculum objectives into small steps. These form the basis for our medium term planning with the block small steps guidance and examples.

Class teachers complete weekly (short-term) plans for teaching of each mathematics lesson. This lists the specific learning objective for each lesson and gives details of how the lessons are to be taught. It also gives details of how the lessons are taught. It also includes details of how children will be supported and/or challenged, as well as key mathematical language, mathematical variation and further challenges.

Implementation: Summary

The statutory programmes of study from the National Curriculum are implemented at Sleights through:

- White Rose Hub Schemes of Learning in Early Years, Key Stage One and Key Stage Two.
- a bespoke Early Years curriculum, for children aged two to five, based on expectations set out in the Early Years Foundation Stage Framework and White Rose Hub.
- daily mathematics lessons, consisting of allocated key skills time and knowledge development, focused on acquiring and building on mathematical facts, methods and strategies.
- quality first teaching, designed to meet the needs of all children.
- effective and purposeful use of a wide range of manipulative resources to support conceptual, pictorial and abstract understanding.
- ongoing development of the learning environment, including working walls, manipulatives and challenges.
- a robust and progressive approach to calculation and times tables.
- support for children with additional needs, through booster or intervention programmes.

Impact: how do we ensure that children are learning?

Assessment for learning is fundamental to raising standards and enabling children to reach their potential. Assessment in mathematics takes place daily using a range of strategies such as marking and feedback, verbal discussions with children and response time.

In addition, children complete regular 'low stakes' assessments, to provide an ongoing overview of the impact of mathematics teaching. These assessments include end of teaching and learning block tests (from White Rose Hub) and weekly times tables tests.

Summative assessment activities are carried out at Sleights using the NTS test papers across Year 1 – 6. These are completed on a termly basis, with scaled score information being produced. This data is compared with children's targets, set out by Fischer Family Trust 20. Teachers use assessment information to inform their future planning.

Learning environment

The learning environment at Sleights is consciously calm and promoting purpose and independence. Each classroom will have a learning environment which encourages children to be supported and independent by offering:

- a resource hub of appropriate resources and manipulatives for children to access and use.
- a working wall which reflects learning in the current unit, including shared learning and children's work. This includes vocabulary and relevant known facts.
- an increasing collection of mathematical texts to support the curriculum's delivery, through the school's curated mathematical texts spine.

Presentation expectations

Our school has high expectations of children's work. It is important, particularly when developing an increasing understanding of mathematical concepts, that children are supported to present their thinking and work in a systematic way. This is achieved in a number of ways.

For example, children are taught to use one digit per squared box, to demonstrate place value. Children are also taught to use the existing lines on squared paper/pages to support measure activities, such as drawing shapes, or statistic tasks, such as data collection.

Sumdog

At Sleights, all children from Year 1 onwards have access to a Sumdog profile. In Reception, accounts are introduced over time. Sumdog is used as an online platform to support the recall and practise of key mathematical concepts and understanding. At Sleights, this is also used as a tool for reinforcing learning through homework activities.

Online multiplication tables checks are also generated and used on Sumdog.

Our school approach to multiplication times tables

At Sleights, the teaching of multiplication tables is completed through a systematic, whole class approach. Our intent is to break down the learning of each times tables into manageable chunks. Children are taught, alongside each other, one times tables per term, irrespective of prior attainment. Children are supported to learn at the same pace, with catch up and pre-teach sessions used as necessary.

Within each term, children are taught one times tables fact at a time, ensuring this is fully understood and grasped, before moving on to extend knowledge. This includes a firm understanding of the commutative law and the relationship with division facts.

Each year group in school has a progressive set of times tables facts that will be taught across three terms. This sequence builds on already known facts, adding new knowledge incrementally over the child's time in school.

See Appendix A for full summary of the school's approach to times tables

Family support

We all have an important role to play in children's learning and their attitude and competence with maths can influence the learning of their child. The school will encourage families to support their child with homework activities, maths games and Sumdog (online maths platform) challenges.

Families will be given opportunities to attend maths workshops alongside their children to learn about the maths topics covered in school and teaching methods used.

We will also update families on their child's progress in maths through:

- Parents evenings
- A written end of year report.
- Informal discussions.

Teaching Multiplication Times Tables at Sleights

Intent: Expectations of multiplication knowledge

The National Curriculum states that children should be taught:

- **Year 1:** counting in 2s, 5s and 10s
- **Year 2:** recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- **Year 3:** recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- **Year 4:** recall multiplication and division facts for multiplication tables up to 12 × 12

Our school's approach to multiplication times tables will support all children to gain a secure understanding of multiplication facts, which builds on and develops knowledge over all areas of mathematics.

Implementation

At Sleights, the teaching of multiplication tables is completed through a systematic, whole class approach. Our intent is to break down the learning of each times tables into manageable chunks.

Children are taught, alongside each other, ***one times tables per term***, irrespective of prior attainment. Children are supported to learn at the same pace, with catch up and pre-teach sessions used as necessary.

Within each term, children are taught ***one times tables fact*** at a time, ensuring this is fully understood and grasped, before moving on to extend knowledge. This includes a firm understanding of the **commutative law** and the relationship with **division facts.**

Children are provided with two weekly assessment opportunities, to ensure that no child falls behind.

The teaching sequence

Each year group in school has a progressive set of times tables facts that will be taught across three terms. This sequence builds on already known facts, adding new knowledge incrementally over the child's time in school.

In EYFS	In Year 1	In Year 2	In Year 3	In Year 4	In Year 5	In Year 6
Children recognise, write and count in 1s	Children count in 2s, 5s and 10s,	Children multiply x10 (A), x2 (Sp), x5 (S)	Children multiply x3 (A), x4 (Sp), x6 (S)	Children multiply x7 (A), x8 (Sp), x9 (S) and remaining facts	Children are provided with ongoing opportunities for using and applying multiplication times tables knowledge.	

A: Autumn Sp: Spring S: Summer

The teaching sequence *continued*

Children learn the smallest multiplication fact from the times table being studied first and progress from this point. On all occasions, children learn the times table as a **memorised phrase**, for example:

> "*1 x 6 = 6, spoken as one times six equals six*"

Over time, with increasingly secure confidence and understanding, staff will support children to recognise alternative ways of repeating this known fact ("multiplied by, the same as, lots of")

In addition, staff will build confidence through exploring related division facts and other knowledge (such as larger numbers). This will include presenting the known fact in alternative ways, so that the children gain a secure knowledge and understanding before progressing to a new fact.

When beginning a new times table, the children revisit already known facts (gained from previously taught times tables), but most time is spent learning new knowledge.

All multiplication times tables sessions will be taught in mathematics lessons.

Reinforcement

Known facts will be revisited and reinforced in the classroom setting in a range of ways. This will ensure children are provided with ongoing opportunities to retain and utilise gained knowledge. Activities for revisit and reinforce may include:

- Inclusion in daily key skills / 10 in 10
- Cross curricular application activities
- Maths games, including online using Sumdog
- Building connections with other known facts
- Extend connections with other related division facts

Impact and Assessment

Ongoing assessment of times table knowledge is gathered through two weekly activities. These include a paper based and online assessments. Teaching staff maintain records of the children's progress in paper based assessments over time.

Paper based activities:

- Each times table has related assessment booklet which is completed over the course of the term when this is being taught. These booklets are designed to offer incremental challenge and difficulty, as children learn more new facts over time. Children mark their own work, filling in gaps, or corrections, if necessary.
- One section from each booklet is completed per week.
- Children are given two minutes to complete as many questions as they can.
- This is a timed activity, but the timed element is be handled in an age and stage appropriate manner.
- At the end of the two minutes, the adult leads the children in self marking, with the full times table fact read out. The children repeat this fact back. This is completed using the same memorised phrase style used in the teaching sequence (for example:
- "*1 x 6 = 6, spoken as one times six equals six*")

Online activities:

- Teachers use Sumdog to set online assessments each week, using the 'Multiplication Tables' activities feature. This activity is designed support all children in preparation and consolidation of the Year 4 Multiplication Tables Check.

Teaching Progression

Year 2		
Autumn Term	**Spring Term**	**Summer Term**
X10	**X2**	**X5**
1 x 10	2 x 2	
2 x 10	3 x 2	3 x 5
3 x 10	4 x 2	4 x 5
4 x 10	5 x 2	5 x 5
5 x 10	6 x 2	6 x 5
6 x 10	7 x 2	7 x 5
7 x 10	8 x 2	8 x 5
8 x 10	9 x 2	9 x 5
9 x 10		
10 x 10		
10 facts	**8 facts**	**7 facts**

Year 3		
Autumn Term	**Spring Term**	**Summer Term**
X3	**X4**	**X6**
3 x 3		
4 x 3	4 x 4	
6 x 3	6 x 4	6 x 6
7 x 3	7 x 4	7 x 6
8 x 3	8 x 4	8 x 6
9 x 3	9 x 4	9 x 6
6 facts	**5 facts**	**4 facts**

Year 4		
Autumn Term	**Spring Term**	**Summer Term**
X7	**X8**	**X9**
7 x 7		
8 x 7	8 x 8	
9 x 7	9 x 8	9 x 9
3 facts	**2 facts**	**1 fact**

Year 4		
Throughout Year 4, in preparation for the Multiplication Times Tables Check		
11 x 2	11 x 3	11 x 4
11 x 5	11 x 6	11 x 7
11 x 8	11 x 9	11 x 10
11 x 11	12 x 11	12 x 12
12 x 2	12 x 3	12 x 4
12 x 5	12 x 6	12 x 7
12 x 8	12 x 9	12 x 10