



STOWER PROVOST COMMUNITY SCHOOL

Curriculum drivers

The curriculum is underpinned by the school's Curriculum Drivers: Engage, Develop, Innovate and Express. The spiritual, moral, social and cultural development of our pupils and their understanding of the core values of our society are woven through the curriculum.

Mathematics Curriculum Statement

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1. Curriculum Statement

Intent

At Stower Provost School, our curriculum closely follows the aims of the National Curriculum for Mathematics 2014 to enable all children to:

- become fluent in the fundamentals of mathematics
- be able to reason mathematically
- solve problems by applying their mathematics

At Stower Provost School, these skills are embedded within maths lessons and developed consistently over time. We are committed to ensuring that children are able to recognise the importance of maths in the wider world and that they are also able to use their mathematical skills and knowledge confidently in their lives and within a range of different contexts. We want all children to enjoy mathematics and to experience success in the subject, with the ability to reason mathematically. We are committed to developing children's curiosity about the subject, as well as an appreciation of the beauty and power of mathematics.

Implementation

The content and principles underpinning the 2014 Mathematics Curriculum and the maths curriculum at Stower Provost reflect those found in high-performing education systems internationally, particularly those of east and south-east Asian countries such as Singapore, Japan, South Korea and China. These principles and features characterise this approach and convey how our curriculum is implemented:

- teachers reinforce an expectation that all children are capable of achieving high standards in mathematics
- the large majority of children progress through the curriculum content at the same pace
- differentiation is achieved by emphasising depth of knowledge and through individual support and intervention
- teaching is underpinned by methodical curriculum design and supported by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge
- practice and consolidation play a central role
- carefully designed variation within this builds fluency and understanding of underlying mathematical concepts
- teachers use precise questioning in class to test conceptual and procedural knowledge and assess children regularly to identify those requiring intervention, so that all children keep up
- children's explanations and their proficiency in articulating mathematical reasoning, with the precise use of mathematical vocabulary, are supported through the use of stem sentences provided by the teacher

To ensure whole school consistency and progression, the school uses the White Rose Maths teaching progression for the mixed classes as well as the individual lesson resources. This is supplemented with other fluency, reasoning and problem-solving style questions from other reputable schemes and sites. The school is developing the mastery approach to teaching mathematics with a greater focus on problem-solving and reasoning opportunities within each lesson. Continuous Professional Development and professional discussions ensure

that staff at all levels understand the pedagogy of the approach. Children are encouraged to use concrete resources, pictorial representations and abstract thinking (the C-P-A approach) when approaching their mathematics each day. This helps children tackle concepts in a tangible and more comfortable way.

Teachers use careful questions to draw out children's discussions and their reasoning. The class teacher then leads children through strategies for solving the problem, including those already discussed. Children then progress to their fluency, reasoning and problem-solving questions which have small elements of variation in order to move on a child's thinking. Children complete a range of questions within each lesson. Mathematical topics are taught in blocks, to enable the achievement of 'mastery' over time. Each lesson phase provides the means to achieve greater depth, with children who are quick to grasp new content, being offered rich and sophisticated problems, as well as exploratory, investigative tasks, within the lesson as appropriate. This is not limited to a fixed group and the opportunity to achieve a greater depth of understanding is offered to all pupils who are quick to grasp the content.

Impact

The school has a supportive ethos and our approaches support the children in developing their collaborative and independent skills, as well as empathy and the need to recognise the achievement of others. Students can underperform in mathematics because they think they cannot do it or are not naturally good at it. The White Rose Maths programme addresses these preconceptions by ensuring that all children experience challenge and success in mathematics by developing a positive attitude to mathematics and resilience in the face of difficult tasks, in line with the 'MathsEveryoneCan' ethos of White Rose.

Regular and ongoing assessment informs teaching, as well as intervention, to support and enable the success of each child. These factors ensure that we are able to maintain high standards, with achievement at the end of KS2 above the national average.

2. Teaching and Learning

A typical mathematics lesson lasts about 60 minutes. Mathematics is taught daily during the morning. Children begin with a short fluency activity which supports the conceptual understanding of number facts and recall. Following this, the main lesson begins with an initial task which is a contextual problem that is shared for the children to discuss in partners. This helps promote discussion and ensures that mathematical ideas are introduced in a logical way to support conceptual understanding. In KS1, these problems are almost always presented with objects (concrete manipulatives) for children to use. Children may also use manipulatives in KS2. Teachers use careful questions to draw out children's discussions and their reasoning and the children learn from misconceptions through whole class reasoning. Following this, the children are presented with varied similar problems which they might discuss with a partner or within a small group. At this point, scaffolding is carefully reduced to prepare children for independent practice. This part of the lesson may not be recorded in books as discussion or the use of whiteboards are conducive to pace and risk-taking. The teacher uses this part of the lesson to address any initial errors and confirm the different methods and strategies that can be used.

Following this, the class progress to the 'Practice' part of the lesson, which is designed to be completed independently. This practice uses conceptual and procedural variation to build fluency and develop greater understanding of underlying mathematical concepts. In this part of the lesson, some children will be encouraged to use concrete resources alongside pictorial representations. Others might be supported through additional scaffolding provided by the teacher, which may include provided models of the calculation method that the

children will need to use, or copies of the worded question, with key aspects and vocabulary highlighted. These questions are then followed by reasoning and problem-solving questions to encourage children to take their understanding to a greater level of depth.

3. Assessment

3.1 Assessment for Learning (AfL):

Children receive effective feedback through teacher assessment, both orally and through written feedback, and AfL is integral into the design of each lesson;

- the structure of the teaching sequence, ensures that children know how to be successful in their independent work
- common misconceptions are addressed within the teaching sequence
- at the end of the lesson, the children review their work and indicate how confident they feel about their learning using a traffic light colour by the learning intention for the lesson
- the traffic light is reviewed by the teacher during review of the children's work to inform where consolidation might be required
- opportunities for additional practice and correction are provided by the teacher, as appropriate, during marking, with a focus on clarifying misconceptions and providing opportunities to move learning on

3.2 Formative Assessment:

Short term assessment is a feature of each lesson. Observations and careful questioning enable teachers to adjust lessons and brief other adults in the class if necessary.

At the end of each blocked unit of work, the children sometimes also complete the carefully aligned White Rose Maths 'End of Unit Assessment'. The outcome of this is used by the teacher to ensure that any identified gaps in understanding can be addressed before the next unit is taught. This can inform dialogue with parents and carers during open evenings, as well as the judgements made at the end of the term as to the extent that each child has achieved the expectation for their year group.

3.3 Summative Assessment:

Teachers administer a termly arithmetic paper and reasoning and problem-solving paper provided by Hodder Education. The results of these papers are used to identify children's ongoing target areas, which are communicated to the children, as well as to parents and carers at Parents Evening. They are also used alongside the end of unit assessments and outcomes of work, to inform the whole school tracking of attainment and progress of each child.

Assessment data in mathematics is reviewed throughout the year to inform interventions and to also ensure that provision remains well-informed to enable optimum progress and achievement. End of year data is used to measure the extent to which attainment gaps for individuals and identified groups of learners are being closed. This data is used to inform whole school and subject development priorities for the next school year.

4. Planning and Resources

The use of mathematics resources is integral to the concrete – pictorial – abstract approach and thus planned into teaching and learning. The school has a wide variety of good quality equipment and resources to support our learning and teaching. These resources are used by our teachers and children in a number of ways including:

- demonstrating or modelling an idea, an operation or method of calculation - resources for this purpose would include: a number line; place value cards; base 10; place value counters and grids; money or coins; measuring equipment for capacity, mass and length; bead strings; the interactive whiteboards and related software; 3D shapes and/or nets; Numicon and related resources and software; multilink cubes; clocks; protractors; calculators; dice; number and fractions' fans; individual whiteboards and pens; and 2D shapes and pattern blocks (this list is not exhaustive)
- enabling children to use a calculation strategy or method that they couldn't do without help, by using any of the above or other resources as required

Standard resources, such as number lines, multi-link cubes, Base 10, hundred squares and counters are located within individual classrooms. Resources within individual classes are accessible to all children who should be encouraged to be responsible for their use. Further resources (often larger items shared by the whole school) are also available as part of a central supply in the shared resources room.

An interactive teaching tool for the purpose of modelling strategies is available to all teachers as part of the White Rose Maths Scheme as well as the standard tools available through the interactive whiteboard Promethean programme. Resources to support teachers' own professional development and understanding of new approaches as part of a mastery approach are available on the White Rose Maths website. As well as overviews of learning, these include short videos which demonstrate new methods to ensure accuracy. The school is also a White Rose Maths Premium member, which provides access to additional related resources and reference materials that teachers can use in, as well as to inform, their lessons.

The subject leader is looking to attend training in the local area and to make links with other Maths Leads within neighbouring settings or within schools that already have links with the school. The subject leader is looking to join a local mathematics hub to improve their own professional development and to disseminate good practice and other opportunities throughout the school.

This will ensure that the school's provision is informed by current national pedagogy and government publications and the conceptual understanding of all aspects of the core curriculum.

High quality resources from White Rose and other reputable websites are used in each year group. Teachers are encouraged to use the school playground, field, outdoor classroom and outdoor learning areas as much as possible when the topic is appropriate.

5. Organisation

The school has implemented a blocked curriculum approach to the teaching of mathematics. This ensures that children are able to focus for longer on each specific area of mathematics and they can develop a more secure understanding over time. This approach is also designed to enable children to progress to a greater depth of understanding.

Subsequent blocks continue to consolidate previous learning so that the children continually practise key skills and are able to recognise how different aspects of mathematics are linked. For example, when children have completed a block which has enabled them to master the multiplication of two-digit numbers, a subsequent block on area and shape might provide

opportunities to use this understanding when calculating the area of shapes with 2-digit length and width dimensions.

Where appropriate, the mathematics topic will be linked to the overall topic being studied. For example, Roman Numerals may be taught with a topic on the Romans.

6. **EYFS**

In Reception, children have a daily 30 minute mathematics lesson, which broadly follows the White Rose scheme. This is supplemented with NCETM resources. The lesson consists of:

1. Whole class oral and mental starter - 5 minutes
2. Whole class main teaching - 10 minutes
3. Independent and group tasks – 15 minutes

The oral and mental starters focus on a broad range of topics such as shape, measure, time, patterns etc. to help develop an understanding of these concepts. Children enjoy sharing their understanding, talking about maths and the practical elements of these maths activities.

The clarity and focus of the White Rose and NCETM resources allows teachers to focus on developing and strengthening fundamental maths concepts and skills and also to address any misconceptions that may arise. The structure of the lesson enables teachers to secure a good balance between whole class work, group teaching and individual practice. It also allows teachers to establish regular routines thereby maximising teaching time. It supports assessment on a daily basis, as well as providing individual verbal feedback to children, ensuring that children have a clear understanding of the task they have completed, as well as any next steps.

In Reception, the independent activities offered at the maths table link to the focus for the week. For example, if the focus for the week is sorting and grouping, then activities on the maths table will often link to this. In addition to these planned independent activities, children also can self-select maths resources to consolidate their learning during child-initiated activities. We recognise the importance of play-based learning and therefore encourage children to develop their understanding during their play. Such opportunities are provided in both the inside and outside environment.

Regular observations and assessments help to ensure that children that need additional intervention to consolidate their mathematical understanding are identified and supported by appropriate interventions.

7. **KS1 and KS2**

Mathematics Lessons

In Years 1 to 6 English lessons take place every day and are taught to the whole class by the class teacher. They are effectively differentiated to ensure that every child can access the learning intention and high expectations are had for all pupils. These lessons cover knowledge and skills in all mathematical topics.

Through Years 1 to 6 we use White Rose as a coherent programme of high-quality materials and exercises, which are structured to build deep conceptual knowledge alongside developing procedural fluency. These resources are supplemented by other high-quality

resources, such as NCETM and NRICH. The lessons include differentiation through depth of understanding or targeted scaffolding and support. Teachers also plan activities and additional tasks which offer support and also provide further challenge for children who are able to progress further in their learning.

8. Equal Opportunities

The school is committed to ensuring the active participation and progress of all children in their learning.

All children will be given equal opportunities to achieve their best possible standard, whatever their current attainment and irrespective of gender, ethnic, social or cultural background, home language or any other aspect that could affect their participation or the progress of which they are capable.

9. Inclusion

Taking a mastery approach, differentiation occurs in the support and intervention provided to different children, not in the topics taught, particularly at earlier stages. The National Curriculum states:

‘Children 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.’

There is little differentiation in the content taught but the questioning and scaffolding individual children receive in class as they work through problems will differ, with higher attainers challenged through more demanding problems, which deepen their knowledge of the same content before acceleration onto new content. Children’s difficulties and misconceptions are identified through immediate formative assessment and addressed with rapid intervention – commonly through individual or small group support later the same day. A range of inclusion strategies, as listed on the school’s inclusion planning key, are embedded in practice and teachers are aware of the special educational needs of the children in their Maths class, as well as those who have English as an additional language. Although the expectation is that the majority of children will move through the programmes of study at broadly the same pace, the 2014 National Curriculum states:

‘Decisions about when to progress should always be based on the security of children’s understanding and their readiness to progress to the next stage.’

If a child’s needs are best met by following an alternative plan, including coverage of the content from a previous year, this will be overseen by the SENDCo, in collaboration with the class teacher and with the knowledge of SMT. Specific arrangements for the provision of children with SEND will be communicated to parents and carers during SEND reviews.

10. Role of the Subject Leader

- The subject leader will raise the profile of Maths at Stower Provost Primary School through best practice. They will model lessons, as appropriate to new staff, NQTs and peers to support continued professional development. The subject leader will support staff in providing opportunities for learning outside the classroom in maths and will identify and organise opportunities which enable this, as appropriate.
- The subject leader will monitor progression and continuity of maths throughout the school through lesson observations and pupil voice interviews, as well as the regular monitoring of outcomes of work in maths exercise books.
- The subject leader will ensure that all staff have access to year group plans and the relevant resources which accompany them.
- The subject leader will monitor children's progress through the analysis of whole school data. They will use this data to inform the subject development plan which will detail how standards in the subject are to be maintained and developed further.
- The subject leader will, on a regular basis, organise, audit and purchase central and class-based maths resources.
- Through ongoing involvement in the DfE funded Maths Hubs programme, the subject leader will keep up to date on current developments in maths education and disseminate information to colleagues.
- The subject leader will extend relationships and make contacts beyond the school.
- The subject leader will develop opportunities for parents/carers to become more involved in maths education.
- The subject leader will ensure that all staff have access to professional development including observations of good practice in the subject.

11. Parents

- The school recognises that parents and carers have a valuable role to play in supporting their child's mathematical learning. An overview of the maths curriculum is available on the school's website, as well as guidance in the progression of skills used by the school. Paper copies of these documents are also available on request and the curriculum letter, sent home by each year group, also outlines the maths topics to be covered.
- Children are given maths homework at least once a week from Year 2 to Year 6.
- Parents are informed of their child's progress at Parents Evenings and this is also communicated in written school reports.
- Parents and carers are encouraged to speak to their child's teacher at any point during the year, either informally or by making a specific appointment. Information about their child's standards, achievements and future targets in maths is shared during parent/carer meetings, as well as ways that parents/carers may be able to assist with their child's learning.
- The school also provides a number of opportunities for parents/carers to learn about what their child is learning and the way their child is being taught through parent workshops.