Mathematics at Asterdale

Intent:

Purpose and Vision:

Mathematics provides a foundation for children to understand the world, promoting reasoning, problem-solving, and fluency in number operations. Our broad and balanced programme of learning follows the National Curriculum, meeting all statutory requirements, and ensures children develop the ability to think logically, approach problems systematically, and apply mathematical concepts to everyday situations such as budgeting, understanding scientific data, and analysing developments in technology.
Fluency in basic number operations allows children to perform calculations accurately and efficiently, while reasoning skills enable them to explain their thinking and justify solutions.

Through the learning of these skills, mathematics prepares children for the demands of future education and equips them with tools for real-life tasks.
Additionally, mathematics encourages children to develop crucial personal growth skills such as resilience and perseverance. Such attributes support pupils in becoming confident learners across all areas of the curriculum. This holistic approach ensures that mathematics at Asterdale is not just about numbers, but about nurturing critical thinking and preparing children for a successful future.

Our Mathematics Curriculum Aims:

At Asterdale, our mathematics curriculum aims to foster a love of learning, encourage confidence, and ensure that every child, regardless of their starting point, has the chance to succeed and fulfil their potential.

As part of our commitment to ensuring children leave Asterdale with 'secondary school readiness' we aim to ensure our children are:

- Fluent in the fundamental skills of mathematics; including times tables and efficient mental and written strategies for addition, subtraction, multiplication and division

- Able to reason mathematically; identifying patterns, making connections and justifying mathematical thoughts

- Able to solve problems by applying mathematical concepts; breaking down problems, identifying operations / strategies required and presenting answers in context.

Our curriculum is structured using White Rose Education's Small Steps to Progression as a spine, providing a consistent framework that enables mastery learning in mathematics. Teachers design lessons based on their professional judgement and expert knowledge of their children's cognitive development and scaffolding needs, ensuring that children receive adapted support to achieve deep understanding.

To promote mastery, all lessons incorporate regular retrieval practice to reinforce prior knowledge and ensure long term memory retention, alongside worked examples that demonstrate strategies clearly. Guided and independent rehearsal allows children to practice concepts at their own pace, promoting fluency and confidence in their skills. Opportunities for children to deepen their understanding are embedded within lessons, encouraging application of mathematical concepts in varied contexts.

Formative and summative assessments are used diagnostically to inform teaching next steps, ensuring that interventions are timely and focused. This approach ensures that all children make secure progress in their learning journey, moving from concrete understanding to abstract reasoning as they master each concept.

By following these principles, our curriculum not only promotes competence in mathematics but also allows children to develop a genuine love for the subject and the resilience necessary for lifelong learning.

Inclusion sits at the heart of our mathematics curriculum and learning is designed to support children of all abilities, including those with SEND and the most able, through targeted intervention and appropriate challenge.

As part of our commitment to ensuring our mathematics curriculum is personalised for all children, progression from concrete to abstract learning may involve the revisiting of areas of learning to ensure deep mastery and long-term mathematical retention.

Teaching teams work hard to ensure pupils at Asterdale develop a meaningful understanding of mathematical concepts that can be applied across different contexts.

Children's Knowledge, Skills and Understanding:

Our mathematics curriculum is mapped from Nursery to Year 6, with each mathematical strand building on the foundations mastered in the year(s) before. This allows us to ensure consolidation and extension of our pupils' understanding over time.
Our skills progression maps are available on our website and can be accessed here: download.asp

Our curriculum engages children in key *substantive knowledge* (established facts) of:

- Number facts – including number bonds and times tables
- Number types – including negative numbers, Roman Numeral system
- Arithmetic – place value, operations (+ / - / x / ÷)
- Measurement – metric and appropriate imperial units and reading of the time
- Fractions – including equivalence and decimal/percentage correspondence
- Geometry – properties of 2D/3D shape, angles

Our substantive knowledge progression maps are available on our website and can be accessed here: download.asp

Alongside this, our curriculum also ensures progression in key *disciplinary knowledge* (reasoning/problem solving strategies) such as:

- Reasoning – using 'proofs' to move from observation to certainty
- Problem solving through application of concepts
- Modelling – including using algebra, graphs, units of measurement
- Precision in calculation – working systematically

As part of our holistic approach to mathematics learning and teaching, across our school, children are exposed to a rich variety of tier 2 and 3 mathematical language. Our vocabulary progression maps are available on our website and can be accessed here: download.asp

At Asterdale, teachers make use of the DfE's Ready to Progress criteria to ensure that pupils have mastered key mathematical concepts, providing a strong foundation for future learning and life skills. We are committed to ensuring that all pupils:

- By the end of Key Stage 1, have mastered number bonds to 10, developed fluency in the 2, 5, and 10 times tables, and understood the principles of addition and subtraction up to 100. Children will be confident in basic fractions, understand simple measurements, and be able to describe basic 2D and 3D shapes.
- By the end of Key Stage 2, have a secure understanding of place value to 1,000,000 and be able to perform efficient long multiplication and division. They will have mastered fractions, decimals, and percentages and be able to solve problems that involve these. Pupils will use algebraic reasoning, calculate perimeter and area, and interpret data from a variety of graphical representations.

Implementation:

At Asterdale Primary School, we implement a carefully structured, inclusive mathematics curriculum that supports all pupils to achieve fluency, reason mathematically, and solve problems with increasing confidence. Rooted in the National Curriculum and mapped from Early Years to Year 6, our curriculum ensures continuity and progression through a mastery approach. It is delivered consistently using research-informed lesson structures, tailored to the developmental stages of our learners.

Early Years Foundation Stage (EYFS) Implementation:

In Early Years, mathematics is taught through a blend of adult-led inputs and rich play-based provision, in line with the Early Learning Goals and Development Matters statements. Using the NCETM's Mastering Number as the spine of their curriculum, teachers identify key sub-strands – such as number, numerical patterns, shape, space, and measures – and communicate the learning intent clearly to support staff working alongside the children.

Lessons begin with a consideration of prior knowledge, with adults using questioning and observation to assess understanding and revisit learning. Vocabulary is explicitly taught and modelled through adult interaction and the regular use of sentence stems to scaffold children's early mathematical talk.

New mathematical concepts are introduced in short, engaging inputs using strategies such as stories, songs, and manipulatives. Continuous provision is then enhanced to embed mathematical concepts, with prompts and structured resources supporting children's independent exploration. Learning is scaffolded through visual and concrete resources, and opportunities for depth are provided through reasoning prompts and challenge activities.

Children reflect on their learning through informal group discussions and individual talk, while formative assessment is continuous and used to shape future provision. Staff record observations through photos, notes and floor books to monitor progress and identify next steps.

Key Stage 1 and 2 Implementation:

In KS1 and KS2, maths lessons follow an evidence-informed structure that supports mastery and aligns with Rosenshine's Principles of Instruction. Each lesson adopts the following components:

Learning Objective as a title - Clear articulation of the learning goal to ensure lesson focus.

Daily Retrieval Practice – Children revisit prior knowledge through activities such as 'Do Now' tasks or 'Can We Still?' quizzes that incorporate content from the previous lesson, week, and term. The intent of such activities are to strengthen memory and encourage children to make connections across concepts.

Vocabulary & High-Quality Talk – Tier 3 vocabulary is introduced or revisited and displayed on working walls. Definitions, visuals, and sentence stems are used to support all learners, including EAL and SEND pupils.

New Learning – New concepts are presented in small steps with clear modelling, visual representations, and high-quality questioning to check for understanding. Teachers use worked examples and tools such as mini whiteboards and cold calling to engage all learners.

Guided Practice – Learning is scaffolded through modelling, joint construction, and independent attempts to support pupils' move towards independence.

Independent Practice (Overlearning) – Pupils complete sequenced tasks designed to build fluency, reasoning and mastery. Tasks are recorded in books where appropriate to do so in order to develop children's mathematical transcription skills. However, teachers will use opportunities to explore mathematical concepts practically where impactful, to inspire children and foster a love of maths learning. Challenge questions and tasks are used to promote depth.

Adaptive Teaching & Scaffolds – At Asterdale, we are committed to ensuring that all pupils, regardless of ability, receive an appropriate level of support and challenge in mathematics, with scaffolding gradually reduced as children's accuracy and confidence builds.
Our approach to differentiation includes:
- Tailored support for pupils who need additional scaffolding, through resources such as manipulatives and visual aids, as well as small-group interventions.
- Stretch and challenge opportunities for higher-attaining pupils, through open-ended problem solving, opportunities for mathematical exploration, and extension tasks that encourage deep thinking and connections across concepts.
- Adaptive teaching strategies, including task variability and flexible groupings, to ensure all pupils are engaged and appropriately challenged at each stage of their learning.
- Personalised learning plans for pupils with SEND or EAL, ensuring that all pupils have access to the full curriculum, with the necessary support to achieve their full potential.

Through this comprehensive approach to differentiation, we ensure that every pupil can achieve fluency, reasoning, and problem-solving skills at their own pace and level, while also being encouraged to explore mathematics beyond the curriculum and deepen their understanding.

Plenaries / Exit Quizzes – Learning is reviewed through questioning, discussion, and low stakes exit tasks to consolidate key learning and check understanding.

Assessment for Learning –
At Asterdale, assessment is an integral part of the mathematics learning process. We utilise a range of formative assessment techniques—including, but not limited to, cold calling, mini-

whiteboards, hinge questions, verbal feedback, and peer/self-assessment—to monitor and evaluate pupils' understanding in real-time. These assessments provide immediate feedback to both pupils and teachers, enabling responsive teaching and learning adjustments within the lesson. Teachers use this information to make real-time decisions, such as revisiting concepts, providing interventions, and adjusting the pace or challenge of tasks.

By collecting data through multiple forms of assessment, teachers can identify patterns in learning, ensure the lesson is effectively meeting the needs of pupils, and adapt teaching strategies to suit individual needs. In addition, assessment is used to plan for future lessons, ensuring that teaching is based on the current progress and needs of pupils. This approach allows pupils to receive the support they need to achieve deep understanding of key mathematical concepts.

Across the school, inclusion is a priority, with all learners – including those with SEND or EAL – accessing lessons through appropriate adaptations and support. The use of the Concrete–Pictorial–Abstract approach ensures that mathematical concepts are developed with understanding and confidence.

Through this consistent, well-sequenced and inclusive implementation, children at Asterdale develop the fluency, reasoning, and problem-solving skills needed for success in school and beyond. They build resilience, confidence and a love for mathematics that underpins their broader learning.

Impact:

The impact of our mathematics curriculum at Asterdale Primary School is evident in the deep understanding, fluency, and resilience demonstrated by our pupils. Through our carefully sequenced curriculum, we ensure that all children, regardless of their starting points, achieve securely in mathematics, are resilient learners and are well-prepared for secondary education and beyond.

Fluency and Mathematical Competence: Achieve

Our curriculum is designed to ensure children gain fluency in the fundamental skills of mathematics, particularly in number operations, times tables, and problem-solving strategies. By the end of Key Stage 2, pupils are confident in performing mental and written calculations accurately and efficiently. They can apply their skills to real-life contexts such as budgeting, understanding scientific data, and interpreting developments in technology.

Reasoning and Problem Solving:

Through our focus on reasoning, pupils develop the ability to justify their thinking and explore mathematical concepts deeply. Children demonstrate this through discussions, explanations, and logical connections, both independently and collaboratively. In all year groups, pupils are encouraged to identify patterns, make connections, and apply their learning to solve problems. Our curriculum embeds challenge through stretch tasks and reasoning prompts, which encourage pupils to explore multiple methods of solving problems.

Children’s progress in mathematics is measured using both formative and summative assessment:

- Termly summative assessments (using PiXL assessments) provide clear benchmarks in

fluency, reasoning, and problem solving. These assessments are moderated internally and externally, across The Odyssey Community Trust, to ensure accuracy and consistency.

- Classroom-based evidence, including pupil workbooks, verbal reasoning tasks, and the use of sentence stems, is regularly reviewed to monitor pupils' ability to explain and apply their mathematical thinking.

- Internal Pupil Progress Meetings are held termly, with the SLT, to discuss outcomes and identify pupils requiring additional support or challenge. Intervention impact is reviewed regularly to ensure it is accelerating progress.

As a result of this structured and consistent assessment process, the majority of pupils make sustained and positive progress from their starting points, including those with additional needs.

Personal Growth: Resilience

Mathematics at Asterdale does not just focus on developing technical skills but also nurtures essential personal attributes such as perseverance and resilience, in keeping with our key school drivers. Children are encouraged to approach challenges with a positive mindset, developing the confidence to persevere with problems, take risks and learn from mistakes. Our structured approach to lesson delivery promotes confidence and reduces anxiety, particularly for those who may find maths challenging.

This holistic approach ensures that pupils are not only mathematically competent but also equipped with the resilience to become confident learners across all subjects. Behaviour during maths lessons is focused and purposeful, reflecting strong engagement and a positive attitude towards learning.

We track attitudes to learning through pupil voice and teacher observations. These indicate high levels of participation and enthusiasm, even among pupils who initially lacked confidence in the subject.

Inclusive and Tailored Support:

Inclusion is central to our approach, and we ensure that all children, including those with SEND and EAL, have access to high-quality mathematical learning. SEND pupils have individual support plans and, where applicable, have specific maths targets that are reviewed each term in collaboration with teachers, the SENDCO, and parents. Our use of adaptive teaching strategies, scaffolding, and targeted interventions ensures that every pupil receives the support they need to succeed. Additionally, stretch tasks for higher attainers ensure that all pupils are appropriately challenged and can achieve their full potential.

Long-Term Retention and Mastery:

Regular retrieval practice, effective use of the Concrete–Pictorial–Abstract approach, and careful scaffolding enable pupils to master concepts progressively. Teachers monitor pupils' understanding closely through formative assessments and adapt teaching strategies based on real-time feedback. As a result, pupils retain knowledge over time, apply their learning to new situations, and build a deep understanding of mathematical concepts.

Consistent Progression and Secondary Readiness:

Pupils at Asterdale make strong, reliable progress from Reception through to Year 6. By the

time they leave our school, they are equipped with the necessary skills to succeed in secondary school mathematics. Our curriculum is mapped to ensure that all key mathematical concepts are consolidated, extended, and revisited to ensure deep mastery. This approach ensures that pupils leave Asterdale with both the academic competence and the personal attributes needed for lifelong success.

Quality of Education

The design and delivery of our maths curriculum is evaluated continuously to ensure it provides a high-quality education that equips children with the skills to succeed academically, whilst preparing them for the demands of future education, careers and life.

Subject leader monitoring includes lesson observations and book looks to assess consistency, challenge, and curriculum coverage. Pupil voice surveys and learning walks provide insight into how pupils perceive their learning and how well they can articulate key concepts. Regular CPD and coaching sessions for staff, including participation in the NCETM Maths Mastery programmes, focus on refining subject knowledge, pedagogical practice, and effective use of mathematical representations.

As a result, maths teaching across the school is consistent and well-sequenced, with pupils building on prior knowledge and becoming increasingly confident, competent mathematicians.

The impact of our mathematics curriculum is ultimately evident in the high standards of pupil achievement, with recent end-of-key-stage outcomes reflecting this. Attainment in maths has been above the national average at Key Stage 2 for the past two years, and above 70% for the past 4, consecutive years.