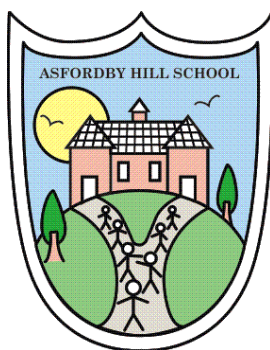


The Asfordby Hill School



Achieving High Standards in all that we do.

Maths POLICY

This Policy Links With: Teaching and learning Policy SEN Policy	
Recommended:	Y
Statutory:	
Date Reviewed:	November 2019
Date of Next Review:	November 2021
Committee Responsible for Review:	QEHS
Signature of the Chair of Governors:	

*“The essence of mathematics is not to make simple things complicated, but to **make the complicated things simple.**” – Stan Gudder*

Rationale

This policy outlines the teaching, organisation and management of the mathematics taught and learnt at Asfordby Hill Primary School.

The school’s policy for mathematics is based on the document ‘2014 National Curriculum’ where we promote a whole school ‘mastery approach’ to learning.

At the centre of the mastery approach to the teaching of mathematics is the belief that **all children have the potential to succeed**. They should have **access to the same curriculum content** and, rather than being extended with new learning, they should **deepen their conceptual understanding by tackling challenging and varied problems**. Similarly, with calculation strategies, children must not simply rote learn procedures but demonstrate their understanding of these procedures through the use of **concrete materials, pictorial representations, worded explanations and reasoning**.

This policy has been written as a result of extensive staff discussion and has the full agreement of the Governing Body. The implementation of this policy is the responsibility of all the teaching staff.

Intent

In maths, we foresee that every child leaves Asfordby Hill Primary School a mathematician – ‘*Every Child a Mathematician*’. To achieve this, we aim for all our children to acquire the following:

- Number Sense – the ability to think analytically with numbers; spotting patterns and relationships and adopting efficient methods that have been committed to long-term memory.
- A confident and competent approach to age- relevant problem solving.
- The ability to use a broad range of mathematical strategies; using metacognitive approaches to determine the best method.
- An ability to represent number in a variety of ways and contexts.
- The mathematical skills that will enable them to become confident and functional citizens.

Implementation

At Asfordby Hill, our pupils are provided with a variety of opportunities to develop and extend their mathematical skills in a variety of classroom contexts and situations:

- Small group work
- Targeted interventions
- Whole class quality first teaching

Below, we will further outline how we implement our curriculum intentions and how we help to create mathematicians of the future.

What you will see in our classrooms:

A) Teaching for Mastery

The mastery curriculum contains **three main principles**.

- Fluency
- Reasoning
- Problem Solving

At Asfordby Hill, these components are interwoven within mathematics lessons to enable children to deepen their understanding of curriculum objectives whilst developing their conceptual understanding and procedural fluency.

Fluency contains three essential component parts: **efficiency, accuracy and flexibility**.

To increase fluency children should become proficient at:

- Learning times table facts,
- Division facts,
- Doubles and halves,
- Number bonds to 10, 20, 100 and 1000
- Mental addition and subtraction of two-digit numbers

At AHS, we teach children to acquire '**Number Sense**': the ability for children to work fluidly and flexibly with numbers. This approach enables children to acquire procedural fluency (confidence in calculation). From the moment they start school, we teach children to see and use numbers using a variety of 'representations' to enable them later to flexibly apply their knowledge and skills to different problems.

Reasoning

To be able to reason, children should be able to offer a conjecture, prove and/or explain their ideas. They should be able to form links between mathematical ideas as well as applying and testing hypotheses.

Consider the following:

- | | |
|---------------------------------|----------------------------------|
| 'I already know that ... so...' | 'This is the same because ...' |
| 'I noticed that ...' | 'This is always true because...' |
| 'I decided to ... because ...' | 'If... then...' |
| 'This is true here because ...' | |

Problem Solving

Problem solving tasks are rich tasks. This means they are problems which have multiple answers or different strategies to solve them. They are not a simple closed question. They may have several steps to complete in order to find the answer. They may use several different elements of mathematics and they are suitable for any ability level.

Under our mastery curriculum, children will access and work on their year group's objectives only. Work will not be differentiated above or below to different year groups. Children will either work on consolidating each objective by working on developing pre-requisite skills or will be taken **deeper** within the objective using all three curriculum aims.

B) Accurate and effective use of assessment

Lessons will be planned based on accurate assessment from the previous lessons. Teachers will model and scaffold excellent mathematical thinking; using concrete and pictorial representations to consolidate conceptual understanding and to advance children's attainment within and across objectives.

All assessment is used to inform teaching and learning. We identify children's understanding and then swiftly focus interventions to overcome misconceptions. At Asfordby Hill, we assess children in four main ways:

- Assessment for learning: continuous (effective questioning, clear learning objectives, the use of success criteria and effective marking/ feedback and response to teaching)
- Termly assessment pupil progress (PUMA)
- End of Key Stage transitional assessments: annually

Towards the end of the school year, we assess and review pupils' overall progress and attainment by drawing upon National Curriculum objectives.

C) Teaching using a Metacognitive Approach

Effective teaching intertwines cognition, metacognition and self-regulated learning. In maths, we ensure that all three of these aspects are developed by our learners within our mathematics curriculum. Not only will our children be extremely competent calculators, but they will be flexible with number and have the ability to apply a range of strategies to different problems. At the heart of this is working memory. In order to be able to apply knowledge, our children need to acquire and then remember facts. Our progressive curriculum enables our children to revise and revisit mathematical learning regularly in order to enable them to transfer knowledge to their long-term memory. Our children will be able to critically analyse the approach they have taken and reflect upon ways they can improve.

D) Pre-teaching/ Provision for SEN and High Attaining Pupils

Pre-teaching is utilised when children are currently working below the lesson objective's requirements - this will provide them with the skills and knowledge needed to succeed. However, when this is not possible, carefully tailored maths interventions are planned to enable the child to fill in the gaps in their knowledge so they can thrive in the future. If children have been assessed to be exceeding the lesson objectives, work and support is tailored appropriately to stretch and challenge. We are equipping children with the skills to become flexible, efficient and accurate learners who can apply their learning in a variety of contexts. In order to reach Greater Depth, they will have to demonstrate consistency across the three aims of mastery - fluency, reasoning and problem solving – across the entirety of the mathematics curriculum.

E) Schemes of Learning

Our teachers follow the White Rose Scheme of learning (EYFS to Y6). The small step progression across each year group enables our children to gradually develop skills and understanding as well as revising learning from previous year groups. White Rose follows our school's approach to maths as it closely follows the three mastery aims within each lesson and objective. However, our teachers use this scheme as a guide and will tailor their teaching dependent on outcomes and will adapt planning to suit the needs of their children. Our staff also use other exceptionally good resources (from NRICH, NCETM and I See Reasoning) alongside White Rose to extend and develop children's learning. Furthermore, high quality

concrete mathematical models and varied pictorial representations are used alongside planning to embed children's conceptual understanding

F) **Development of Quality Mathematical Talk**

At Asfordby Hill, we encourage our children to continue to talk and reason about their maths as we value it as essential part of their learning. Our staff will ask the child to explain **how** they arrived at the answer rather than focussing on the answer itself. They will also be able to describe why and how their solution worked, and how their method is the same or different to those of others. We encourage the children to write about their maths using the following sentence stems to see if others can follow their explanation:

I think this because... I know the next number is because...
This can't work because... When I tried....I noticed that...
All the numbers begin with... First I did this...then I did this...

~

Impact

The majority of children at Asfordby Hill leave us as highly-skilled mathematicians. Our end of Key Stage outcomes emphasise and showcase the effectiveness of the teaching and learning displayed in our classrooms.

In 2019, at the end of Key Stage 2, **100%** of pupils achieved the Expected Standard in maths with **43%** of those achieving the Greater Depth standard.

The impact of our implemented curriculum has provided the following for our children:

- A culture of hard work and dedication to the acquisition of mathematical skills.
- A lifelong love of mathematics
- Maths teaching that provides challenge yet enables all children to succeed.
- A developed growth mindset and an understanding of who they are as learners.
- The freedom to calculate with confidence and competence
- The flexibility to draw upon a wide repertoire of knowledge and skills
- The ability to articulate mathematical theories and ideas with confidence
- An inquisitive mind