



MATHEMATICS POLICY

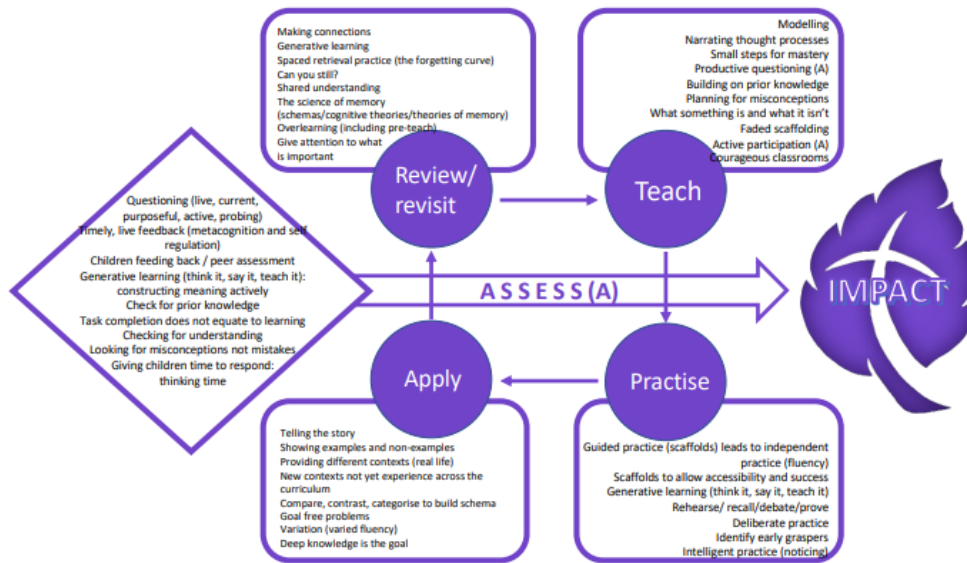
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At Aston, we believe that our maths curriculum ensures that all children know and remember more. We firmly believe that everyone can achieve and enjoy maths. Our curriculum is based on mastery principles where pupils acquire a deep, long term, secure and flexible understanding of maths. We intervene quickly so that ALL children are able to access the curriculum with appropriate scaffolding. Sometimes this involves pre-teaching of concepts and sometimes consolidation work. We aim to fade our scaffolding so that all children can access learning with confidence. Our long-term plan is based on a blocked curriculum to ensure children develop a strong understanding of the maths that has been taught to enable children to move onto more advanced material. Underpinning this, is planned spaced retrieval which consists of ‘Can I Still?’ activities and deliberate practice. Using the Long-Term plan will ensure this is not left to chance. ‘Can I still?’ activities include the generative activities of brain downloads, multi-choice questions, quizzes, summarising, mapping, drawing and imagining. We remember what we pay attention to, so teachers draw children’s attention to important learning points.

Maths Lessons at Aston

Teachers use the DSAT Teach Simply Model as the pedagogical approach to the teaching of mathematics.



(DSAT update September 2023)

REVIEW

In maths lessons, prior knowledge needs to be deliberately activated so at the start of every maths session before new ideas are introduced, time is spent enabling all children to revisit the knowledge they will need. This REVIEW helps children to make connections and should be generative so all students are engaged in retrieving their existing schema.

TEACH

In maths lessons, all children are working on the same objectives supported by scaffolds where necessary. Teachers model their thinking through narrating their thought processes. They actively teach form is conceptions and plan for small steps in learning to ensure no child is left behind.

PRACTICE

Guided practice usually involves intelligent practice where children are encouraged to notice things and spot patterns. Children are working on questions when they are asking themselves what is similar about the questions and what is different. Independent practice allows children to build their fluency.

DELIBERATE PRACTICE

All children have a deliberate practice session everyday in addition to their maths lesson. During this time, the teacher will take the vulnerable children to ensure they ‘keep up’ rather than ‘catch up.’

APPLICATION

The goal of maths teaching and learning is deep knowledge where the children can apply their learning in different contexts. They are flexible in their thinking and can choose appropriate methods and apply them efficiently and accurately.

Teaching and Learning In Maths

We plan and teach maths to develop a range of underpinning mathematical skills in number, calculation, geometry and statistics. This is delivered through a discrete maths lesson using the White Rose Scheme, with additional links made in other curriculum subjects where learning can be further maximised. Children are encouraged to think through their learning, make connections between it and apply skills to a range of different problems and contexts.

Children learn mental strategies to develop quick recall, the use of known facts and the vocabulary of mathematics. These concepts are regularly tested in order for the children to develop confidence and efficiency.

Calculation strategies are delivered through the school's Calculation Policy, which provides a progressive series of conceptual methods from Reception to Y6.

Assessment is carried out against the National Curriculum (2014) outcomes

Every term, NTS tests are used as a form of assessment to identify strengths and weaknesses of children's progress and provide a scaled score relative to their age and the point in the year. End of block assessments are used from Y1-Y6 to support judgments of children's learning.

Termly Pupil Progress meetings using these assessments to support judgements of children's learning are used to support provision, identify areas of weakness and develop next steps for CPD. Gaps found in a child's learning can be fed into following planning.

Teaching and learning is planned from the White Rose Maths Hub materials (WRMH), based on the National Curriculum (2014). This is broken down by year and term through the school's yearly cycle planning. This is further detailed in medium term plans (MTP) and then in weekly lesson plans.

Structure of Maths Lessons:

- The whole class working on the same mathematics- learning together.
- Daily fluency sessions which involve counting.
- Children being challenged with tasks that develop depth and mastery.
- Concepts and procedures being practiced thoroughly so children have the experience of success.
- Key areas being 'overtaught' to help embed and link knowledge together.
- Conceptual understanding being taught alongside procedural understanding.
- Teachers who are aware of potential misconceptions and children who can spot tricky questions and explain why other children might find them tricky.
- The teacher moving around the classroom, asking the appropriate questions to facilitate learning and deeper thinking.
- Teachers using intelligent practice to encourage children to notice things that stay the same, things that change and provide the opportunities to reason and make connections.
- Teachers and pupils being brave and learning from their mistakes.
- Maths areas which are being accessed by the children
- Manipulatives being used to provide a positive impact.
- When appropriate, children self-selecting equipment from the maths area.
- Maths working walls being used by the teacher and children

The learning environment will contain a specific maths working wall. These include:

- Specific maths vocabulary - This should be added to throughout the current area of learning as new vocabulary is introduced.
- Times Table grid - The relevant times tables for the year group (Y1/2 2,5,10 –Y3 3,4,8 Y4/5/6/ up to 12x12)
- KIRFS for the current half term
- Operations posters (+ -x /) to be displayed during relevant learning
- Stem Sentences are displayed on the working wall and referred to in the lesson.
- Other models and images are displayed that have been shared in the lesson
- Varied fluency challenges for the prior/current learning

- Reasoning and problem solving questions for prior/ current learning
- Concrete resources to support learning
- Times table challenges / number bonds/ place value (dependent on KS)

What you will hear at different time in maths lessons:

- The correct vocabulary being used and children being encouraged to answer questions in full sentences.
- Good noise – pupils are on task and try to prove their points during discussions.
- Children talking about what they have noticed and making connections between new concepts and what they already know.
- Teachers and children celebrating the importance of mistakes. (Research shows that when children make mistakes in maths, their brain grows, synapses fire and connections are made.)

The CPA (Concrete, Pictorial, Abstract) Approach

Children and adults can find maths difficult because it is abstract. The CPA (Concrete Pictorial Abstract) approach builds on children's existing knowledge by introducing abstract concepts in a concrete and tangible way. It involves using concrete materials and pictorial representations as a bridge to more abstract symbols and problems.

The representations chosen (whether concrete or pictorial) need to clearly show the concept being taught and in particular the key difficulty point. Staff use the representation to expose the structure of the maths being taught. Concrete apparatus is used in all year groups and with all pupils. Children use concrete apparatus to explain their thinking. In the end, the pupils need to be able do the maths without the representation. A stem sentence describes the representation and helps the pupils move to working in the abstract.

Fluency

There are three strands of fluency:

- Efficiency – carrying out the method easily
- Accuracy – careful recording, use of key facts and double checking
- Flexibility- knowledge of more than one approach. These are taught throughout Maths lessons

At the beginning of each year, class teachers share their class' fluency targets with parents. These fluency targets are taught and practiced in maths lessons and deliberate practice sessions. They are assessed at least once per term and children supported to keep up rather than catch up. This information is recorded and tracked through the year and children are identified quickly to support them with gaps in their facts.

Quick Recall Facts

To help develop our children's fluency in mathematics we focus on learning Quick Recall Facts each half term. This half termly focus is shared with parents at the beginning of the year so that the children can be supported at home. Assessments of these take place and are tracked through the year. Additional support is given for the pupils identified as needing further practise to embed these facts.

Number Bonds

Having knowledge of number facts supports pupils to think mathematically as they can use them to reason, see structures, pattern and make connections. Time set aside to retrieve these facts is seen as a learning opportunity. In FS, Y1 and Y2, all children have a 10-minute fluency session every day in addition to their maths lesson to work on their number sense. We use <https://play.numbots.com/#/intro> to ensure all children have the opportunity to practice independently.

Times Tables

We support our children to learn times tables to automaticity. This is important so that working memory is not overwhelmed. We teach the concept of multiplication and build a deep conceptual understanding of what the numbers represent.

From Spring term in Year 2, we practice times tables daily using 'Clare Christie's Multiplication'. These are practiced for 5 minutes daily. This includes:

- Whole Class teaching of times tables. E.g. chanting of multiples, number stick, using manipulatives.
- 3 minutes of independent practice of times tables with 40 questions.
- Whole class echo reading of the times tables aloud to aid memory
- Selection of the trickier times tables identified to practice additionally.

At home, children have access to Times Tables Rockstars to practice. Teachers set times tables to practice specific tables each week.

Each half term, we have a Times Table Rockstars and Numbots competition between key stages. This takes place over the holidays. The top three competitors for each competition will receive certificates. In Year 4, pupils will have additional practice in the Spring and Summer Terms. Pupils will practice using TTRS for 10 minutes daily on 'Garage' which prepares them for the Y4 Multiplication Check.

We have an annual meeting for parents in Year 4 which supports their understanding of the statutory times tables check. Maths Subject Leader monitors the uptake of TTRS and Numbots at home.

Reasoning Mathematically

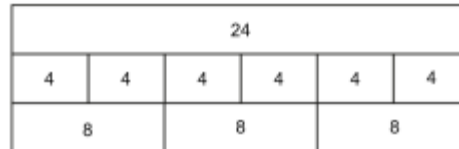
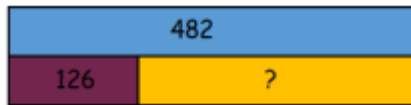
Reasoning about what we already know in order to work out what is unknown will improve fluency. Strategies include:

- Spot the mistake
- True or false
- Using the inverse
- Always/sometimes/never
- Odd one out
- What do you notice?
- Convince me/Prove it/Generalise
- Estimation

As teachers, we focus children's attention and encourage them to notice the structure of mathematics. We ensure children choose the most appropriate method.

Problem Solving

Children are taught the problem-solving skills of Act it out or Draw, Trial By Improvement, List or Table, Pattern, Simplify, Working Backwards or using Algebra. They are supported to develop skills in bar modelling. The bar model is used in teaching for mastery to help children to 'see' mathematical structure. It reveals structure within a problem gaining insight and clarity to help solve it.



Maths Assessment

NTS Tests

We use the National Test-Style Assessment from Hodder Education as an accurate and informative summative assessment. These tests give us standardised scores we can compare against national standards. The tests also provide the opportunity for us to conduct gap analysis. This means that we can see which area of maths a child needs to work on to ensure automaticity.



The Multiplication Tables Check

The Multiplication Tables Check is an on-screen check consisting of 25 times table questions. Year 4 children take part in the Check in June. Children have 6 seconds to answer each question. The purpose of the check is to determine whether children can fluently recall their times tables up to 12 x 12.

Parent Partnership

We highly value the parents and carers within our community. We know you want the absolute best for your children and will help anyway you can. There are many ways you can help your child in maths. We all use maths at home in everyday activities while shopping, measuring and calculating. You can talk to your child about things like planning meals for the week or making a shopping list and estimating the cost. Homework in maths includes working on Quick Recall Facts, practising facts and using online resources that parents are regularly updated about.

