



## Teagues Bridge Maths Policy

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Governor responsibility	Drew White

## Vision statement

Our philosophy for mathematics is replacing an idea that maths is lots of rules and numbers with a study of patterns and connected ideas. This can be achieved by children developing a clear fluency in mathematical concepts and calculation methods, then using these concepts and methods to solve mathematical problems, applying reasoning and developing life skills.

Teaching supports this through quality first teaching, inspiring curiosity and developing children's ability to follow a line of enquiry. This approach will lead to accelerated progress in children's achievement and a love of mathematics.

## Aims to achieve the vision

The National Curriculum for mathematics aims to ensure that all pupils:

- Become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems.
- **Reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language. e.g. "Convince me that..." or "I know that...so..."
- Can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions. The Bar Model device is used throughout the school to support problem solving.

- Are taught through the **Concrete** → **Pictorial** → **Abstract** sequence, to ensure they gain a thorough understanding of the mathematical concepts/skills they are learning.
- Should be given the opportunity for every relevant subject to develop their mathematical fluency and mathematical skills.

Using the new Maths Curriculum 2014, we aim to develop:

- a positive attitude towards mathematics and an awareness of the fascination of mathematics
- competence and confidence in mathematical knowledge, concepts and skills
- an ability to solve problems, to reason, to think logically and to work systematically and accurately.
- initiative and an ability to work both independently and in cooperation with others
- an ability to communicate mathematics and mathematical concepts
- an ability to use and apply mathematics across the curriculum and in real life

## How the school policy aligns with the National Curriculum

At KS1 and KS2 teachers plan their lessons following the statutory guidance and instruction of the Mathematics Curriculum 2014.

Through careful planning and preparation we aim to ensure that throughout the school children are given opportunities for:

- becoming fluent with mathematical knowledge
- taking on challenges and reasoning mathematically
- practical activities and mathematical games
- problem solving
- individual, group and whole class discussions, activities and decisions
- open and closed tasks
- A range of methods of calculating eg. mental, pencil and paper, jottings on white boards,

## Planning in maths

The programmes of study are organised in a distinct sequence and structured into separate domains: Number and Place Value; Addition and Subtraction; Multiplication and Division; Fractions, Decimals, Percentages, Ratio and Proportion; Algebra; Measurement and Geometry. Pupils should make connections across mathematical

ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

In our school we use a number of documents to inform our planning.

### **Long term and medium term planning**

The National Curriculum and foundation stage curriculum makes up the school's long term planning and identifies what is to be taught to each year group. The school's long term plan is divided into blocks allowing for deep learning of each area to be attained before moving onto the next block of learning. These are based around the White rose small steps planning model but have been adapted to ensure learning is revisited more often. This allows children to revisit the core learning of place value, the 4 operations and fractions termly and therefore children can build on their prior knowledge and develop fluency in mathematics. The medium term plan breaks up the white rose planning highlighting which steps are to be taught, which national curriculum statement the lesson or group of lessons relates to, what the children are learning and which manipulatives will best support the children. This is in conjunction with the calculation policy.

### **Short term planning**

The above schemes of learning support daily lesson/flipchart planning. Lessons are planned using a common planning format and are monitored at intervals by the mathematics subject leader. EYFS planning is based on the medium term plans and delivered as appropriate to individual children with thought to where the children are now and what steps they need to take next.

When completed, class teachers will file the medium and short term plans in the Planning folder on the school's T Drive. The plans will then be used and modified the next time that the units are taught. In this way, we will be able to develop a scheme of work for maths that is a useful working document which is constantly being updated. White rose small steps documentation (Primary SOL) can be found at <https://whiterosemaths.com/resources/schemes-of-learning/primary-sols/>

### **Key features of teaching and learning**

- A range of teaching strategies are implemented to address the needs of all learners.
- A wide range of models and images, including Numicon and the bar model, are used to strive for accelerated progress across each Key stage.

- Concrete apparatus such as: Numicon, Multilink, Dienes, ten frames, number cards and fans, bead strings and rods are used to support children's mathematical understanding.
- Implementing a flexible, adaptive and intelligent approach to assessment for learning, which will bridge gaps and inform planning
- Promote a culture of independency and problem solving
- Secure a knowledge of mathematical fluency before moving onto reasoning and problem solving.
- Teaching assistants are used for rapid interventions and to allow children to keep up with the rapid pace of learning.

## Assessment

### Formative assessments

- Ongoing assessment of children's progress through observation, intervention and marking, indicates the next step in the learning process and the teachers planning. These are an informal part of every lesson and are closely matched to the learning objectives. Relevant comments and annotations will influence the next day's planning.
- Teacher, Pupil self-assessments and Peer assessments will be recorded regularly in books to give evidence of achievement during that lesson.
- Fix it comment marking will be used to stretch and challenge pupils, assessment of how this is responded to will also influence future planning for groups and individuals. VF will be used to address misconceptions immediately in lessons and CH to address mistakes.
- Key objectives inform assess and review which in turn inform planning.

### Summative assessments

- Formal termly assessments take place in December, March and June, using the white rose summative termly assessments.
- Analysis of termly assessment results in December, March and June to inform targets and future planning.
- Question level analysis is completed by teachers to highlight which mathematical areas are strong within the class/ year group and which need to be a focus for the upcoming term.
- Maths co-ordinator analyses the teachers question level analysis looking for whole school patterns and trends. These are then fed into the school improvement plan and addressed by CPD.
- Mid- term progress report to parents in forms of achievement and attainment against national average and next steps for children to develop further.

- End of year report to parents.
- Initial Baseline assessment provides a benchmark for Reception children.

## Teaching time

Years 1 – 6: To provide adequate time for developing a range of mathematical concepts, skills and processes – ‘using and applying mathematics, counting and understanding number, knowing and using number facts, calculating, understanding shape, measuring and handling data’, – each class teacher teaches a daily mathematics lesson. This may vary in length but will usually last between 45 minutes and an hour. Through careful assessment, planning and preparation, we aim to ensure that children are given opportunities for:

- Practical activities and mathematical games
- Problem solving
- Individual, small group and whole class discussions
- Open and closed tasks
- A range of methods of calculating e.g. mental, paper and pencil and calculator
- Working with ICT
- Outdoor learning

## Lesson structure

Most maths lessons will follow a structure of: CLIC maths, fluency, reasoning and problem solving, with all learners having some exposure to each of these strands. Depending on the ability of the children or the grasping of a particular concept the weighting of: fluency, reasoning and problem solving will vary.

### Flashback 4 – Fluency and revisit :

All lessons will include an opportunity to revisit prior learning and to develop fluency. In most cases, this will involve the use of WR Flashback 4 which uses the principles of spaced learning.

- o The first question is likely to be something children did in the previous lesson.
- o The next question is something they did last week, to keep that ticking over.
- o The third and fourth questions are related to concepts they studied last month, or maybe much earlier in the year (or even last year).

**AFL (5 minutes)** – An AFL question or questions are used to assess the children’s starting point for the lesson and inform the teaching and activities the children will undertake in the lesson. AFL’s allow the teacher to then tailor the lesson to each learner or groups of learners. These AFL questions are normally fluency based and pitched at the expected standard for that year group.

**Fluency (10 – 30 depending on progress of child in the lesson)** – This part of the lesson focusing on the mechanics of the maths for the lesson and teach children

to be able to complete the mechanics of the maths both quickly and accurately. This part of the lesson must be mastered by each learner before moving onto reasoning or problem solving.

**Reasoning and problem solving (10 –30 minutes depending on progress of child in the lesson )** – This part of the lesson provides children with challenging contexts to apply the fluency skills they have learnt to different contexts and situations, testing both their ability to apply their skills and explain their mathematical thinking. This part of the lesson develops children into deeper mathematical thinkers. A range of resources are used in the reasoning and problem solving section of the lesson including: White Rose reasoning and problem solving resources of each year group, maths inspire challenges aligned to the learning objective, Nrich problems, deepening understanding reasoning questions, NCETM reasoning and problem solving resources, Dip and pick challenge questions. Children are taught the expert reasoner model as a tool to make them effective reasoners.

In developing the expert reasoner, 5 steps are followed children by the children when responding to reasoning and problem solving questions.

1. **Describing:** what the activity is about.
2. **Explaining:** offering some reasons for what they did. The argument may yet not be complete or accurate. Uses phrases such as 'it's because' or 'it is true' to justify.
3. **Convincing:** confident that their thinking is right and may use words such as, 'certainty' or 'prove'. The underlying mathematical argument will be more accurate than just explaining.
4. **Justifying:** a deductive, logical argument that has a complete chain of reasoning to it and uses mathematical models of proof for *why and why not*.
5. **Expert reasoning** through
  - **Generalising** which is about starting with specific cases and becoming less specific.
  - **Specialising** which is about starting with something general and seeing what it tells us about a specific case. It might seem that generalising is therefore more important (or harder) than specialising, but that is not always true.

By following these steps the expert reasoner is able to present a robust argument that is mathematically accurate, often based on generalisations and specialising information.

## EYFS

Early Years Foundation Stage (EYFS): Teachers and practitioners support children in

developing their understanding of mathematics in a broad range of contexts in which they can explore, enjoy, learn, practise and talk about their developing understanding. This area of development includes seeking patterns, making connections, recognising relationships, working with numbers, shapes and measures, and counting, sorting and matching. Children use their knowledge and skills in these areas to solve problems, generate new questions and make connections across other areas of learning and development.

Children in the EYFS learn by playing and exploring, being active, and through creative and critical thinking which takes place both indoors and outside. We recognise that children learn through routine, continuous provision and incidental learning opportunities, as well as planned sessions and activities. Mathematical understanding can be developed through stories, songs, games, routine, questioning, imaginative play, child initiated learning and structured teaching.

## **Marking**

See Assessment, Recording & Reporting policy.

## **Equal Opportunities**

As a staff we endeavour to maintain an awareness of, and to provide for equal opportunities for all our pupils in mathematics. We aim to take into account cultural background, gender and special needs, both in our teaching attitudes and in the published materials we use with our pupils.

## **Children with Special Educational Needs**

We aim to fully include SEND pupils in the daily mathematics lesson so that they fully benefit from the mathematics curriculum at Teagues Bridge. All SEND children are expected to achieve the objectives of each lesson through adaptive teaching and scaffolds, allowing all children to achieve.

Where necessary, teachers will consult with the SENDCO, draw up an IEP and use this to provide a differentiated curriculum to meet the individual child's needs. This may be via task or through adult support.

## **Gifted & Talented**

Gifted and Talented children, along with the More Able will be planned for accordingly and closely monitored to ensure they achieve their full potential and



mastery of mathematics for their current year group. This will ensure they are exposed to a full range of mathematical problem solving including: Logic, finding all possibilities, visual/diagram problems, worded problems, rules and patterns and generalizations.

## **Cross curricular links**

Mathematics may be taught as a separate subject but every effort is made to link maths with other areas of the curriculum. We try and identify the mathematical possibilities across the curriculum at the planning stage. Following a creative curriculum allows us to plan maths within the theme and embed it through meaningful contexts. Links between maths and other areas of the curriculum are made so that children see that maths is not an isolated subject.

Maths supports literacy through encouraging children to explain, prove and present mathematical conclusions to others both verbally and in written form.

## **Homework**

Homework is intended to consolidate skills or knowledge or to develop and extend strategies and techniques. This follows the unit of Maths the children are currently studying and is set on the purple mash electronic platform. In addition, multiplication facts homework is set on a weekly basis, focusing on one times table in the years 2-6.

## **Role of the subject leader**

- To be lead teachers
  - To ensure all teachers are familiar with the Primary Framework for Mathematics and support them in ensuring that all mathematics teaching is of a high quality
  - To lead by example in the way they teach in their own classroom and in other classes in each Year Group
  - To prepare, organise and lead staff development as necessary
  - To work co-operatively with our SENCOs to ensure that the needs of all children on the SEND List are met
  - To monitor colleagues' teaching capability with a view to identifying the support and development they need
- To provide peer coaching to members of staff to improve pedagogy and accelerate progress across the school.
- To monitor children's learning and the progress that they are making
  - To attend training provided by Local authority, numeracy consultants and other external providers

- To work in partnership with our governors' Curriculum Committee in raising standards in Mathematics across our school
- To provide termly reports to governors on the progress of maths across the school.
- To analyse maths data from termly assessments, looking for common themes and trends across classes, key stages and whole school, taking action to ensure these trends are addressed and progress in made in these areas.

## Review

The policy will be reviewed April 2024