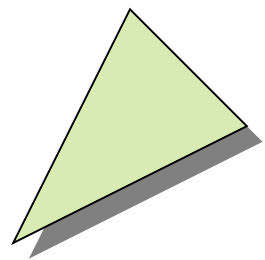
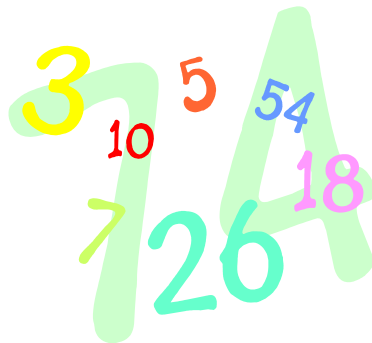
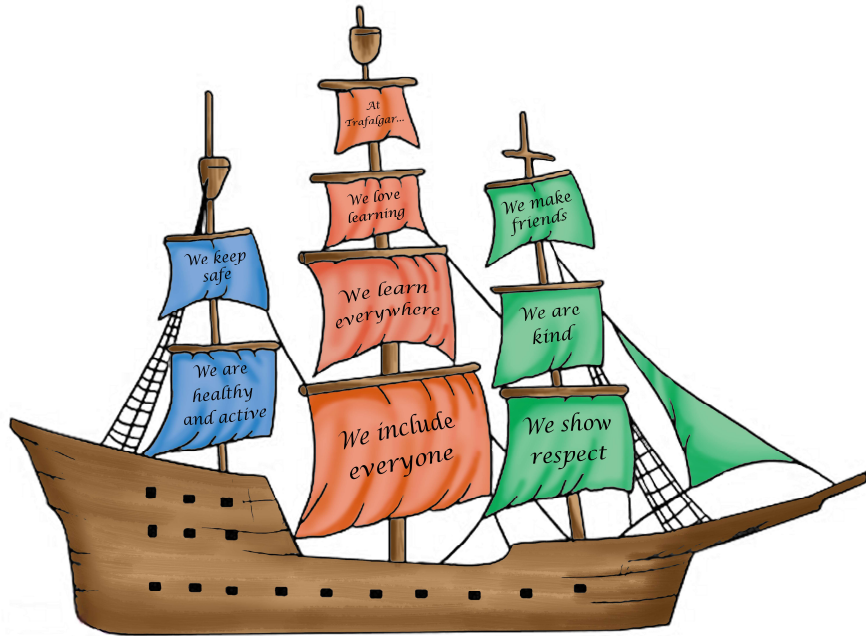


# Trafalgar Community Infant School



## MATHEMATICS POLICY

REVIEWED: May 2021

REVIEW: June 2022

“Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history’s most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.”

(The National Curriculum, DfE 2014)

### **UN Convention on the Rights of the Child**

You have the right to a good quality education. You should be encouraged to go to school to the highest level you can.

#### **Article 28**

Your education should help you use and develop your talents and abilities.

It should also help you learn to live peacefully, protect the environment and respect other people.

#### **Article 29**

## **Curriculum Statement**

### **INTENT**

**The 2014 National Curriculum for Maths aims to ensure that all children**

- **Become fluent in the fundamentals of mathematics**
- **Are able to reason mathematically**
- **Can solve problems by applying their mathematics**

At Trafalgar, we recognise that children enter our school with a varying degree of mathematical understanding and knowledge depending on their previous experiences.

Our aim is to enable all children to:

- Appreciate the power and beauty of maths.
- Enjoy taking on challenges, when learning new concepts or skills.
- Think logically, creatively and imaginatively in solving problems, developing the ability to think for themselves.
- Learn to work collaboratively, negotiating others’ points of view.
- Work mentally with increasing confidence.
- Learn the facts and techniques that they will need in order to further their maths learning.
- Reach the highest standard possible.

### **IMPLEMENTATION**

**Our mastery approach to the curriculum is designed to develop children’s knowledge and understanding of mathematical concepts from the Early Years through to the end of Y2.**

#### Teaching and Learning, Content and Sequence

- In school, we follow the national curriculum and use the White Rose Schemes of work as a guide to support teachers with their planning and assessment.
- The calculation policy is used within school to ensure a consistent approach to the teaching of the four operations over time. This has been developed from NCTM and White Rose materials in consultation with Greenway Academy.
- At the start of each new topic, key vocabulary is introduced and revisited regularly to develop language acquisition, embedding as the topic progresses.
- All lessons begin with a short assessment/opportunity to revisit previous learning to support retrieval practice and develop long-term memory.
- Children are taught through clear modelling and have the opportunity to develop their knowledge and understanding of mathematical concepts. The mastery approach incorporates using objects, pictures,

words and numbers to help children explore and demonstrate mathematical ideas, enrich their learning experience and deepen understanding at all levels.

- Children work on the objective at whatever entrance stage they achieving. Children can ACQUIRE the skill, APPLY the skill or DEEPEN the skill within the lesson.
- Children move through the different stages of their learning at their own pace.
- Children, who have shown their understanding at a deep level within the unit, will have opportunities to apply these skills in a DIVE DEEPER (Greater Depth) activity. This should be challenging and ensure that children are using more than just one skill to be able to answer the mathematical problems.
- Reasoning and problem solving are integral to the activities children are given to develop their mathematical thinking.
- Resources are readily available to assist demonstration of securing a conceptual understanding of the different skills appropriate for each year group.
- Children are encouraged to explore, apply and evaluate their mathematical approach during investigations to develop a deeper understanding when solving different problems / puzzles.
- A love of maths is encouraged throughout school via links with others subjects, applying an ever growing range of skills with growing independence.
- Children with additional needs are included in whole class lessons and teachers provide scaffolding and relevant support as necessary. For those children who are working outside of the year group curriculum, individual learning activities are provided to ensure their progress.

#### Leadership, Assessment and Feedback

- Assessment informs the teaching and learning sequence, and children work on the objectives they are assessed as being at, with fluid boosting available within a 'keep up' not 'catch up' culture.
- Feedback is given on children's learning in line with our feedback policy. Formative assessment within every lesson helps teachers to identify the children who need more support to achieve the intended outcome and who are ready for greater stretch and challenge through planned questioning or additional activities.
- In order to support teacher judgments, children may be assessed using White Rose end of block assessment materials and current and reliable tests in line with the national curriculum for maths. Gap analysis of any tests that the children complete is undertaken and fed into future planning.
- Children's progress is tracked on target sheets and Target Tracker each half term. Copies of the Target sheets are given to the parents at Parents evenings and at the end of each term. Attainment for the year is reported to parents in the end of year reports.
- Children's work is moderated: within year groups, within cross phase teams in staff meetings (Year 3 teachers from Greenway Academy are invited) and at locality moderation events to ensure accuracy and consistency.
- The maths leader has a clear role and overall responsibility for the progress of all children in maths throughout school. Working with SLT, key data is analysed and regular feedback is provided, to inform on progress and future actions.

#### **IMPACT**

- Children demonstrate a quick recall of facts and procedures.
- Children show confidence in believing that they will achieve.
- Each child makes progress.
- The flexibility and fluidity to move between different contexts and representations of maths.
- The chance to develop the ability to recognise relationships and make connections in maths lessons.
- Mathematical concepts or skills are mastered when a child can show it in multiple ways, using the mathematical language to explain their ideas, and can independently apply the concept to new problems in unfamiliar situations.
- Children show a high level of pride in the presentation and understanding of their work.

## SCHEME OF WORK

We follow the Development Matters for the EYFS 2014 and the programmes of study in the 2014 Primary National Curriculum in England, Key Stages 1 and 2.

The Development Matters for the EYFS are:

- Numbers
- Shape, space and measure

The programmes of study for Years 1 and 2 are:

- Number- number and place value
- Number- addition and subtraction
- Number- multiplication and division
- Number- fractions
- Measurement
- Geometry- properties of shapes
- Geometry- position and direction
- Statistics (Year 2 only)

## ORGANISATION

Math is taught through discrete lessons five times a week, through planned play opportunities and through a cross- curricular approach.

This supports children in making rich connections across mathematical ideas and in developing fluency, reasoning and competence in solving increasingly sophisticated problems. We encourage them to apply their mathematical knowledge to science and other subjects.

The class will be working on the same unit, so that **all** children will be engaged in whole class teaching as an introduction, then moving on to group and independent work. Due to the wide range of ability in every class and the need to provide a challenge for each individual, differentiation will come from adult observation and questioning in order to probe for and develop a deeper understanding. The aim is to ensure that all children meet the required end of year objectives for their age range and that some will develop a greater depth to this understanding. Some children may have a specific plan written for them based on their School Support Plan, in order to support them in working on the same program as the rest of the class.

Children work on the objectives for their age group, with an emphasis on access, differentiation and support. Where these objectives are not achievable, suitable objectives are identified from previous year groups, with the aim of supporting children to begin working from their age related objectives as soon as possible.

Differentiation is achieved through effective questioning, through the planning of and completion of varied activities, deeper challenges and opportunities for additional investigations. All work is matched to the next step in each child's mathematical learning journey.

Reasoning, fluency and problem solving are strands for all children to master in the curriculum. Every lesson should have elements of all three strands. Extension work is provided through **diving** deeper but still on the same concept. The emphasis on maths teaching and learning is that it is deep, rich and embeds the learning in a wide variety of contexts. Mathematical tasks should be developing HOTs (Higher Order Thinking Skills) not MOTs (More of the same).

Many opportunities are given for all children to reflect on and talk about their work. They are expected to talk about their learning, to articulate their thoughts in full sentences listen to the views of others and discuss their thinking, methods and strategies with each other.

## RECEPTION

Children develop and further their mathematical understanding through the experiential play-based Foundation Stage Curriculum.

The Early Years Foundation Stage maths curriculum 2014 aims to ensure that all children:

- Can develop and improve their skills in counting, understanding and using numbers.
- Can calculate simple addition and subtraction problems.
- Can describe shapes, spaces and measures.

## YEARS 1 AND 2 (KS1)

Children follow the National Curriculum.

The Key Stage 1 maths curriculum aims to ensure that all children:

- Become **fluent** in the fundamentals of mathematics, in order to develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- Can **reason mathematically** by following a line of enquiry, conjecturing, generalising, developing an argument and justification for their thinking using mathematical language.
- Can **solve problems** by applying their maths to a variety of problems and real-life scenarios, including breaking problems down into smaller stages, showing perseverance in finding solutions.

Our principle focus for maths is to ensure that all children develop confidence and mental fluency with whole numbers, counting and place value. The National curriculum emphasises the importance of all pupils **mastering** the content taught each year. The essential idea behind mastery is that all children need a deep understanding of the mathematics they are learning so that future mathematical learning is built on solid foundations which do not need to be re-taught.

The current National curriculum document says: 'The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils 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.' (National curriculum page 3)

## TEACHING & LEARNING

We want children to:

- Enjoy maths and become passionate about their maths learning both in their own play and in adult-led activities.
- Be willing to persevere to solve problems and take an active role in their own learning; 'have a go' and take risks.
- Collaborate and work together to solve problems, sharing their thinking.
- Contribute and develop their own ideas, making links in their learning and develop their own strategies.
- Celebrate and be proud of their achievements, applying the skills in other learning.
- Have mastered their Age Related Expectations by the end of each academic year.

As well as:

- Have a sense of the size of a number and where it fits into the number system.

- Know basic number facts (e.g. number bonds, doubles and halves) and be able to recall them.
- Use what they know to figure out an answer mentally.
- Calculate accurately, both mentally and with pencil and paper, drawing on a range of strategies.
- Make sense of number problems and recognise the operations needed to solve them.
- Judge whether their answers are reasonable and have strategies for checking them where necessary.
- Suggest suitable units for measuring and develop sensible estimates of measurements; and
- Recognise, describe, draw, compare and sort a variety of different shapes.
- Explain and make predictions from the numbers in graphs, diagrams, charts and tables.
- Have a rich knowledge, understanding and use of mathematical vocabulary; reading and spelling it.

#### A TYPICAL LESSON AT KS1

- **Oral work and mental calculation** (about 5 minutes)

Whole class work to sharpen, recall and develop mental and oral skills.

- **Main teaching activity** (about 40 minutes)

This will start with revisiting a concept from the previous day to assess and imbed knowledge. New material is introduced with a 'Discover' and 'Share' task, which encourages children to their ideas with a partner. These help promote mathematical vocabulary and support conceptual understanding. The White Rose small steps and the NCETM spines support planning. For each step that is introduced there will be a guided practice followed by independent practice. A lesson may focus on one or more steps. Lessons should contain opportunities for fluency, problem solving and reasoning. Rapid graspers will be given the opportunity to dive deeper into their learning. Children will have opportunities to work as a whole class, in groups, in pairs or as individuals throughout the week.

- **Plenary** (about 10 minutes)

An opportunity to work with the whole class to sort out misconceptions and identify progress, to summarise the key facts and ideas and what to remember, to make links to other work and discuss the next steps. Plenaries can occur at any time during the lesson or at the end.

#### A TYPICAL LESSON IN THE EYFS

- **Oral work and mental calculation** (about 5 mins)

whole class work to sharpen and develop mental and oral skills

- **Main teaching activity** (about 10 minutes)

teaching input and pupil activities

work in groups, in pairs or as individuals

#### TEACHING METHODS AND TIME IN THE EYFS

Maths is one of four specific areas of learning in the EYFS, and is broken down into two areas: Numbers and Shape, Space & Measure.

In addition to the document Mathematics: The Framework for Teaching Mathematics, further guidance on the teaching of mathematics in the EYFS is found in the following documents:

- DfEE Curriculum Guidance for the Foundation Stage
- Mathematics and Children in Reception Classes (WSCC)
- The Revised Framework for Mathematics
- Teaching mathematics in Primary Schools (DfE 2020)
- Numicon planning folder & Oxford Owl website
- White Rose Maths Hub resources

The EYFS Team work to develop confidence and competence in mathematical understanding through high quality play and teacher/adult intervention, and through direct teaching. The ratio of the different teaching

and learning opportunities develops throughout the year with the majority of children experiencing mathematics every day. By the end of the Summer term, Foundation Stage children will be experiencing the three elements of mathematics lesson either 3 times a week or daily if appropriate.

In a range of practical play contexts, the children develop their ability to explore and solve problems involving doubling, halving and sharing utilising their own methods.

Mathematics teaching and learning takes place in both indoor and outdoor settings and involves learning through stories, songs, games, imaginative play, construction, sand and water, computing and creative activities.

**Direct teaching** is achieved by balancing the following elements:

- **Directing:** ensuring pupils understand the direction of the lesson including sharing the teaching objectives.
- **Instructing and demonstrating:** adequate demonstration and explanation of required actions.
- **Explaining and illustrating:** giving accurate, well-paced explanations which refer to previous work or methods.
- **Questioning and Discussing:** listening carefully to pupil's responses and responding with constructive open and closed questions which take the learning forward.
- **Consolidating:** maximising opportunities to reinforce and develop what has been learnt.
- **Evaluating pupil responses:** identifying mistakes and using them as positive teaching points.
- **Summarising:** reviewing during and towards the end of the lesson what children have learnt, clarifying misconceptions or giving children an insight into next stage of learning.

In all classes there is an emphasis on direct teaching, which is oral, interactive and lively. It is a two way process in which children are expected to play an active part by answering questions, contributing points to discussions, and explaining and demonstrating their methods to the class.

## **PLANNING**

### **Long Term Planning**

The Statutory Framework for the Early Years Foundation Stage 2014 and the programmes of study in the 2014 Primary National Curriculum in England provide us with an overview for the maths curriculum. Also, each year group has LT Plans in the class Numicon folder That supports the White Rose SOL.

### **Medium Term Planning**

All planning is completed in year groups under the guidance of the Year group Leader using the Statutory Framework for the Early Years Foundation Stage 2014 or the 2014 Primary National Curriculum. Throughout the school we use the White Rose SOL to support planning the small steps children need to take to build a secure understanding of a concept.

This is used as a guide with teachers adapting and amending them to suit the teaching and learning. Plans and objectives are reviewed after every lesson.

### **Short Term Planning**

In the EYFS, all areas have equal weighting and the weekly planning grid reflects this. The weekly teaching of maths is taken from White Rose.

The timetable used in all EYFS classrooms specify when direct maths teaching takes place; either for whole class or groups and individuals.

In KS1, objectives are taken from medium term plans and plotted onto a weekly plan.

The weekly plans are reviewed and evaluated at PPA by each year group to ensure the coverage is correct and matched to children's needs. Amendments, annotations and assessments are written directly onto the plans in order to aid evaluation at the end of the lesson. This ensures that the learning process feeds into the planning cycle and next steps in children's maths learning is appropriately planned for: challenge or support.

In all year groups the learning objective is identified and differentiation discussed for the different abilities in class. The weekly plan includes notes on activities, key questions, vocabulary, teaching points, adult foci, groupings, differentiation, stretch and challenge and assessment for learning. It clearly states how pupils will be challenged, where the teacher's and learning assistant's focus will be. The three strands of Fluency, Reasoning and Problem Solving are covered in each lesson with a focus on investigative learning.

## **ASSESSMENT**

### **The Purpose of Assessment**

Teachers use assessment to identify strengths and difficulties, to set targets for teaching and learning and to plan the next stage of work.

We have specific short and medium term assessment procedures.

### **Short Term Assessment**

Teachers assess progress as an integral part of their teaching through informal observations with an emphasis on oral questioning.

Many daily opportunities are available: the mental starters, plenaries, observations during small group work and during individual discussions. Individual observations and assessments for children are recorded in their maths book or on sticky labels; both as adult comments, pupil voice and pupil own written comments. A code of 'VF' is used to show when verbal feedback is given; the response to 'VF' can then be seen in the child's future work.

Children have personal targets at the front of their book so they know how they can improve. Each child also has a target sheet that is used to record assessments and inform Target Tracker. These target sheets are shared with the child and their parent regularly.

In every lesson assessment is used to:

- check that children have grasped the main teaching point,
- note whether they have any misunderstandings which need to be put right,
- check whether they are ready to proceed further,
- check that children are remembering key number facts and whether they can use mental calculation strategies,
- give information which will inform future lessons e.g. adjusting forthcoming deployment of support staff.

### **Medium Term Assessment**

Medium term assessments are completed on a half termly basis and recorded electronically on 'Target Tracker.'

The purposes of medium term assessment is to:

- identify any misconceptions,
- identify children's progress against their targets including those on Gold plans,
- aid future half term planning,
- use this information to feed back to parents,
- provide information to feed into the child's individual end of year record of progress.



### **Marking and Misconceptions**

All work is marked in line with the school marking policy. We achieve this by using a variety of strategies including self-marking, peer marking and discussions in groups. The teacher will monitor by work sampling any work not directly marked by them.

All adults also record additional information that relates to the equipment or strategy used, any misconceptions that were dealt with and how, and ways to progress.

**NO** rubbers are used in Maths by either adults or children. All mistakes need to be seen by the adult as these can feed into the assessment process and support the teacher and child in identifying misconceptions.

### **RESOURCES**

There are a range of resources for maths lessons:

- Classroom resources
- Central resources
- Human resources
- Computing
- The school grounds

#### **Classroom Resources**

All classes have a maths display showing a Numicon number line, a Hundred Square and the relevant mathematical vocabulary for the week **including stem sentences**.

The maths resources are displayed in one area for cohesive teaching and ease of access for the children.

At appropriate times, a class may also have an interactive display pertinent to the skills currently being taught and children are given opportunities to explore this.

All class-based resources are in clearly labelled trays and the children access them independently in order to support their learning. In KS1, there are toolboxes on each table, which contain a small example of key resources to support children's problem solving and reasoning skills; e.g. number line, 100 square, dienes, bead string, ruler, STEM sentence starters, numicon. This support may be in the form of a pictorial guide, as appropriate.

#### **Non- Negotiables for Maths Displays:**

Any display will support the learning, which is going on in the classroom:

- Key questions to challenge thinking and ask the 'next step'.
- WAGOLs to celebrates pupil's success and achievements.
- Key vocabulary for the concepts being taught/ to support prior learning.
- Provide information to reflect prior learning, facilitate resource management and promote pupil independence.
- 100 square.
- Numicon number line.
- Bonds to 10/ 20/ 100/ 1000, as appropriate to the year group.
- Counting patterns.
- Books with relevant maths theme.
- Challenge cards/ simmering activities for rapid graspers.

#### **Central Resources**

Centrally held resources include equipment for teaching:

- weight and mass
- capacity
- time

- length- trundle wheels

A number of reference books and files are also available as aids in the Resources room.

### **Human Resources**

The learning assistant's role is to help make sure that each child is fully involved and is learning in each lesson. They have their own copy of the plan and use this to aid their assessments.

During input, staff are used to support a range of different groupings, e.g. SEN, EAL, PP, MAT

In group activities, the learning assistant:

- models and encourages use of the target vocabulary,
- makes observations to inform misconceptions and achievements,
- ensures that children understand the learning expected and identifies early any misconceptions in order to support maximum progress for each child,
- questions and encourages children's reasoning skills,
- encourages the children to independently access and use the available teaching aids such as number lines, digit cards etc...

### **Computing**

The use of technology is carefully planned to ensure it is always developing the children's mathematics. The correct resources can support, motivate and inspire the teaching of mathematics in several ways including:

- exploring, describing and explaining number patterns,
- practising and consolidating number skills,
- exploring patterns in data,
- estimating and comparing measures of distance, time etc.
- experimenting with properties of shapes and geometric patterns,
- developing mathematical vocabulary, logical thinking and problem solving skills.

### **PARENT INVOLVEMENT**

Information regarding the areas being taught and the key objectives are given on the topic webs sent home at the start of each new term. An overview of the maths learning for each week is sent home on the parent overview with ideas and suggestions for ways of helping their child.

At the Autumn Term parent meeting, the maths curriculum is discussed and targeted objectives sent home. These are reviewed as necessary, and discussed at the Spring Term parent meeting. Teachers may also update parents informally on a more regular basis where appropriate.

### **Homework**

Parents are also involved in helping their child to complete homework. Homework is given fortnightly in Year 1 and once a week in Year 2 and is linked to a current objective being taught.

All homework is voluntary. The child is praised if they do it but the teacher does not formally mark it.

### **THE ROLE OF THE CO-ORDINATOR**

#### **Monitoring**

The co-ordinator monitors and evaluates the teaching across each year group and makes suggestions to ensure continuity and progression through Lesson Observations, Book Looks and Learning Walks.

Year group planning is available for monitoring electronically and is kept in the year group folder on the server. The co-ordinator requests an annual audit by each year group in order to replenish stock and keep stock up-to-date.

#### **Evidence of Attainment**

There are staff meetings each term to moderate maths work across the school, including Y3 from Greenway, and samples are kept in the Maths Evidence File in the Staff Room.

Annually all results are analysed and new curriculum targets set by each year group team and the Senior Team.

#### **INSET**

As well as attending outside training days and the West Horsham Learning Network meetings on maths, the co-ordinator aims to impart information, training received and “best practice” by giving inputs at INSET sessions or staff meetings.

Reviewed and updated by Terri Brown 21.05.21