



River View Primary & Nursery School

Mathematics Policy 2022

Date: November 2022

To be reviewed: September 2025

Intent

At River View Primary and Nursery School, we intend for pupils to develop a love of maths and enjoy the excitement and challenge that problem solving brings. We also want to equip children with the mathematical skills necessary to assist them in day-to-day life when the time comes for them to leave us. We use a maths mastery approach to deliver active and involving teaching that promotes curiosity, creativity, resilience and growth mind-set. All learning is put into real-life contexts, where possible, to help children understand the role of mathematics in the world around them and encourage them to become life-long learners. Furthermore, we intend to develop children's confidence and self-esteem in maths, which in turn will foster a positive attitude towards the subject through a sense of achievement, success and learning through mistakes.

Rationale

The 2014 National Curriculum aims for pupils to:

- Become fluent in the fundamentals of mathematics through varied and frequent practise with complexity increasing over time.
- Develop conceptual understanding and ability to recall and apply knowledge rapidly and accurately.
- Reason mathematically; follow a line of enquiry, conjecture relationships and generalisations.
- Develop an argument, justification and proof by using mathematical vocabulary.
- Problem solve by breaking down problems into simpler steps, applying knowledge and persevering in solving them.

The National Curriculum ensures continuity and progression in the teaching of mathematics for Key Stages 1 and 2.

The EYFS Framework aims for pupils to:

- Develop and improve their skills in counting
- Understand and use numbers

- Calculate simple addition and subtraction problems
- Describe shapes, spaces and measures

Implementation

At River View Primary and Nursery School, maths will be taught each day for an hour, Monday to Thursday. Each year group in Years 1 – 6 will have an additional 15 minutes on these days to complete year-group-specific targets. Each lesson will have time set aside for reasoning practise. In addition to this, there will be further opportunities to develop and revisit prior learning in weekly 'Pot Luck' lessons and booster sessions. Each week in Years 2 -6, teaching staff will complete interventions with targeted children, planned alongside SLT in Pupil Progress Meetings. A reward initiative is in place called 'Maths is my Superpower', which is used weekly in a celebration assembly. Children receive a certificate and a superhero badge.

Our implementation:

- A consistent, systematic high quality, whole school approach to teaching mathematics using the Maths No Problem scheme. Children are introduced to 'Maths-No Problem!' methods in Reception and enter Key Stage 1 with a secure foundation to this approach
- Maths story books are used in Reception and Year 1 to help children link maths to real life contexts
- Lessons are taught using a multi-method approach to problem solving to support the development of reasoning skills and rich questioning is ongoing throughout each lesson, making cross-curricular links wherever possible
- Children in all year groups use objects and pictures to problem solve in order to help them visualise abstract ideas, where applicable
- Whole class teaching with scaffolding, stretch and challenge for all learners
- Working walls are used as part of daily practice to display concrete, pictorial and abstract representations/ methods

- Additional intervention for children struggling with mathematical concepts
- Misconceptions are identified and used as a starting place for concept building
- Self-assessment to encourage reflection, ownership and growth mind-set
- Monitoring of the planning, teaching and assessment to ensure mathematics is of high quality and consistent across the school
- Planned opportunities throughout the curriculum to extend beyond 'mathematics time' so learning is applied, reinforced and relevant connections identified for the children
- Close monitoring of children making the slowest progress through regular assessments, data analysis and pupil progress meetings with provision adjusted accordingly
- Baseline tests completed during the Autumn Term to inform teachers of individual understanding, which is then used to inform planning and intervention, if needed
- Summative assessment at an additional two points in the year to guide summative judgements and identify any gaps in knowledge
- All staff are trained to be experts in MNP and are passionate about achieving excellence for all
- Ensuring maths is connected across the curriculum through planning and collaboration
- Access to lessons on Maths No Problem online hub. These lessons are used for daily teaching
- Opportunities for parents and other stake holders to attend annual Maths Days, consisting of parental workshops
- Reward initiative in place for children using 'Maths is my Superpower', offering all children the potential to strive for success

Learning Characteristics

We consider it is of vital importance that children learn and develop positive characteristics as individuals alongside academic knowledge and skills. These are qualities that will ensure they continue to learn and thrive throughout their school life and beyond.

We will foster the school's own ethos of 'making our community richer':

- Resilience – Children are encouraged to never give up and know that challenge is positive, not negative. Teachers cascade the message that it doesn't matter if the children get the incorrect answer, as long as they have tried. Children are not afraid to take risks in their learning due to this.
- Independence – Children are encouraged to work independently, taking risks within their own learning in order to make progress and increase attainment levels. The scheme is designed to enable children to independently investigate learning, carefully selecting which tools they feel best will support them.
- Caring – Children are encouraged to care about their work, taking responsibility for their work and resources, both inside and outside of the classroom. Lessons are collaborative, enabling the children to develop their inter-personal skills alongside mathematical skills.
- Helpful – As 'Maths-No Problem!' is a collaborative approach to learning mathematics, children are paired in mixed ability pairings, thus encouraging peer-to-peer support to tackle problems.
- Equality – As previously mentioned, 'Maths-No Problem!' is a collaborative approach to learning mathematics; therefore, it encourages inclusivity. All children complete the same work, however, it is adapted by the class teacher to the needs of the individual. This provides no 'ceiling point' for individuals and boosts self-esteem for those lacking.
- Respect – Children are encouraged to respect the materials used during maths lessons. Equally, it is of the utmost importance that children respect the learning of others by using the school's values at all times.

Teachers Planning and Organisation

Long Term

The National Curriculum for Mathematics 2014, Development Matters and the Early Learning Goals provide the long term mathematics taught at River View.

Medium Term

Reception and Years 1-6 follow the 'Maths – No Problem!' schemes of learning as their basis for their medium term planning documents. These schemes provide teachers with both the key objectives and the small steps involved in meeting these objectives. They support a mastery approach to teaching and learning and have number at their heart. They provide plenty of time to build reasoning and problem solving elements into the curriculum.

Short Term

'Maths – No Problem!' supports daily lesson planning. Lessons are planned using a common planning format and are monitored regularly by the mathematics subject leader. In EYFS, planning is delivered as appropriate to individual children based on where the children are now and what their next steps are. Teachers in EYFS ensure that children learn through a mixture of adult-led and child-initiated activities. These activities should take full advantage of both the inside and the outside areas.

It is imperative that any misconceptions are identified and acted upon quickly to ensure that there are no gaps in children's understanding.

SEND

Daily mathematics lessons are inclusive to children with special educational needs. Where required, children's IEPs incorporate suitable objectives from the National Curriculum or the Early Learning Goals, and teachers should keep these in mind when planning work. These targets may be worked upon within the lesson as well as on a 1:1 basis outside of this time. Within the daily mathematics lesson, teachers have a responsibility to provide learning that is adapted to help support children with SEND. At River View we believe that all children should be given the opportunities and experiences to reach their full potential.

Lessons

In all lessons, learning objectives and subject-specific vocabulary are clearly displayed and discussed. The emphasis in lessons is to make teaching interactive, lively, engage all children and encourage them to talk about mathematics. This will develop the precise use of accurate language in mathematics, especially when providing sentence structures to capture, connect and apply important mathematical ideas.

This can be achieved by involving these elements:

- Instruction
- Modelling—including using appropriate resources and visual displays
- Questioning and discussing
- Consolidating
- Reflecting and evaluating—identifying mistakes and using them as positive teaching points
- Summarising—enabling children to focus on their next step

Parents as partners

We recognise and value the important role parents play in education as they know their child best. Consequently, we encourage parents to engage in an active partnership with the school. Half-termly homework will be sent home in the form of 'Dynamite Dollars' so that parents can help children to consolidate their learning in a cross-curricular approach. Parent workshops will be held so that parents can watch children being taught using a mastery approach and gain a better understanding of how to support mastery at home

Mastery

"In mathematics, you know you've mastered something when you can apply it to a totally new problem in an unfamiliar situation."

Dr. Helen Drury

Maths mastery lessons have pace and teachers are facilitators who ask rich questions to extend children's learning. Every step is deliberate, purposeful and precise. If children are struggling with a concept, more time is spent supporting and building their understanding.

Pupils are invited to demonstrate their solutions and explain their thinking. Lessons include a mixture of short tasks, explanation, demonstration and lots of practice to reinforce learning. Mastery works best when children are secure in their number facts and can free up their working memory for problem solving.

Maths- No Problem!

'Maths- No Problem!' is the scheme that we use to deliver mastery teaching. It is based on the Concrete, Pictorial, Abstract (CPA) approach to teaching. CPA is a highly effective approach to teaching that develops a deep and sustainable understanding of maths in pupils. Often referred to as the concrete, representational, abstract framework, CPA was developed by American psychologist Jerome Bruner. It is an essential technique within the Singapore method of teaching maths for mastery.

Background to the CPA framework

Children (and adults!) can find maths difficult because it is abstract. The CPA approach builds on children's existing knowledge by introducing abstract concepts in a concrete and tangible way. It involves moving from concrete materials, to pictorial representations, to abstract symbols and problems. The CPA framework is so established in Singapore maths teaching that the Ministry of Education will not approve any teaching materials that do not use the approach.

Concrete step of CPA

Concrete is the "doing" stage. During this stage, students use concrete objects to model problems. Unlike traditional maths teaching methods where teachers demonstrate how to solve a problem, the

CPA approach brings concepts to life by allowing children to experience and handle physical (concrete) objects. With the CPA framework, every abstract concept is first introduced using physical, interactive concrete materials.

For example, if a problem involves adding pieces of fruit, children can first handle actual fruit. From there, they can progress to handling abstract counters or cubes which represent the fruit.

Pictorial step of CPA

Pictorial is the “seeing” stage. Here, visual representations of concrete objects are used to model problems. This stage encourages children to make a mental connection between the physical object they just handled and the abstract pictures, diagrams or models that represent the objects from the problem.

Building or drawing a model makes it easier for children to grasp difficult abstract concepts (for example, fractions). Simply put, it helps students visualise abstract problems and make them more accessible.

Abstract step of CPA

Abstract is the “symbolic” stage, where children use abstract symbols to model problems. Students will not progress to this stage until they have demonstrated that they have a solid understanding of the concrete and pictorial stages of the problem. The abstract stage involves the teacher introducing abstract concepts (for example, mathematical symbols). Children are introduced to the concept at a symbolic level, using only numbers, notation, and mathematical symbols (for example, $+$, $-$, \times , $/$) to indicate addition, subtraction, multiplication or division.

'Maths No Problem!' Lesson Structure

A typical lesson will be structured as follows:

- **Explore**

Children begin the lesson with a problem which introduces the lesson objectives. Children are encouraged to use their previous knowledge and understanding to find their own method to solve this problem.

- **Master**

Children regroup and discuss the methods that they used to solve the problem. Teachers discuss the most efficient method with the class which has been laid out by Maths No Problem. These methods can often lend themselves to what the task is.

- **Guided Practice**

Children to work in pairs to complete questions from the textbook using the methods they know or have been taught in the **Master** part of the lesson.

- **Workbook**

Children to work through questions in their Maths No Problem workbook. With the foundations firmly laid, students should be able to move to an abstract approach using numbers and key concepts with confidence. Mastery challenges are available for children who have completed these tasks. In Year One, children are introduced to many new mathematical concepts using the concrete step of CPA. Some children are able to move on to the pictorial and abstract stages but this varies between lessons. Therefore, in Year One, worksheets will be used from the workbook and stuck in to the children's journals when they are confident enough in their understanding to move on to the worksheet. This will aid differentiation in the class but challenge will not be capped.

- **Discussion of answers and misconceptions**

- **Reasoning**

Reasoning is fundamental to knowing and doing mathematics. Children are taught to be systematic thinkers and articulate such thinking in clear, succinct and logical manner. It also involves being able to identify what is important and unimportant in solving a problem and to explain or justify a solution. Reasoning deepens children's understanding of mathematics and highlights any misconceptions they may have.

Impact

At River View Primary and Nursery School, the impact will be seen in the following ways:

- Learning walks and internal monitoring to ensure the teaching and assessment of mathematics is of high quality and consistent across the school.
- External moderation of schools within the cluster
- Our tracking and assessment system (Classroom Monitor) which enables formative and summative assessment to be recorded so that leadership and class teachers have a clear view of progress and of any children who are not on track to make expected progress.
- Pupil progress meetings
- Sufficient and effective additional support for children in danger of falling behind or those experiencing significant difficulty, to enable them to keep up

- Fast feedback (Feedback in lessons) is provided to the children to address misconceptions immediately.
- Pupil voice
- Summative assessments at three points in the year to guide, not dictate, teacher judgements

Assessment

Assessment is an integral part of teaching and learning. Teachers make assessments of children daily through:

- Daily marking of work
- Making observations and discussing children's work with them
- Analysing errors and picking up on misconceptions
- Facilitating and listening to discussions

These ongoing assessments inform future planning and teaching. Teachers readily adapt lessons and short term planning is evaluated.

Termly assessments are carried out across the school using the 'Maths-No Problem!' assessment materials for each year group.

Teachers are responsible for tracking children's attainment in mathematics using the Classroom Monitor program. The progress of pupils is discussed during pupil progress meetings and appropriate interventions are considered and put into place. Termly Learning Conference and half-termly reports allow teachers to share both attainment and progress in mathematics with parents.

Self and peer assessment

Self and peer assessment are vital aspects of 'assessment for learning'. The children assessing their own work or that of others can help develop their understanding of the learning outcome. By developing these skills children learn how to check their own work and eventually identify their own targets for development. For this to be effective teachers need to make sure:

- Children are trained in this process by modelling from the teacher.
- Responses should be agreed upon and used.
- Self-assessment is completed in orange pen or pencil daily
- Peer assessment is completed in green pen or pencil once a fortnight

Role of the Mathematics Subject Leader

- To lead in the development of mathematics throughout the school
- To monitor the planning, teaching and learning of mathematics throughout the school by conducting book scrutiny, learning walks and assessment data analysis
- Observe colleagues to help provide teachers with the support in the teaching of mathematics to help raise standards in mathematics, and where necessary support with planning
- Support ECTs with the planning, delivery and assessment of mathematics
- To keep up to date with new developments in the area of mathematics
- Liaise with the link Governor and attend meetings to keep the Governing Body informed and updated.