

Riverside Primary School

Where everyone matters and every day counts



Mathematics Policy

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Riverside Primary School

Mathematics Policy

This policy is intended to provide clear guidance for the delivery of the Mathematics curriculum throughout the school and over the three stages: Foundation, Key Stage One and Key Stage Two.

Intent

At Riverside Primary School we aim to teach children how to make sense of the world around them by developing their ability to calculate, reason and solve problems. We aim to support children in achieving economic well-being by equipping them with a range of computational skills and the ability to solve problems in a variety of contexts by delivering a mastery curriculum.

Our aims in the teaching of mathematics are:

- to inspire and enthuse our children to develop a love of mathematics through practical activity, exploration and discussion.
- to equip our children with all the necessary skills and knowledge to enable them to become confident and competent mathematicians.
- to become fluent in the fundamentals of mathematics, through varied and frequent practice with increasingly complex problems over time, enabling pupils to develop a secure conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- to develop the ability to solve problems through decision-making and reasoning in a range of contexts.
- to develop a deeper understanding of mathematics enabling children to reason mathematically through enquiry, conjecturing relationships and generalisations which can be proved and justified using mathematical language.
- to meet the statutory requirements of Curriculum 2014.

Our curriculum priorities are: **STAR**

- **Strive:** For all of our children to make good progress from their starting points both personally and academically.
- **Tolerance:** To ensure our children are respectful to others and treat everybody equally. We will offer experiences for our children which encourage them to be considerate, thoughtful and that will make them aware of and celebrate the diverse society we live in.
- **Aspire:** For our children to believe that through hard work and determination they can achieve the goals that they set themselves to become the best they can. We will provide experiences which broaden our children's horizons and show our children the wide range of possibilities available for their future.
- **Resilience:** For our children to be able to work through challenges with a positive mindset; to think creatively and to problem-solve.

Implementation

At our school, we teach mathematics to all children, whatever their ability or individual need. Through quality first mathematics teaching, we provide learning opportunities that enable all pupils to make good progress.

We aim for children to master the key areas and domains in Mathematics, narrowing the gap between the most and least able learners. 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 will always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly will be challenged to deepen their understanding by being offered rich and sophisticated problems and not accelerated through to new content. The expectation is all children, at some point during a unit of maths, will engage in reasoning and applying tasks at their own pace and level.

Mathematics is a symbolic, abstract language. To decode this language, symbols need to come alive and speak so clearly to children that it becomes as easy to understand as reading a story. We believe that all children, when introduced to a key new concept, should have the opportunity to build competency in this topic by taking the Concrete-Pictorial- Abstract approach (CPA).

Concrete - this is the 'doing' stage. Children have the opportunity to use concrete objects and manipulatives to model problems.

Pictorial - this is the 'seeing' stage. Children build on the concrete approach by using pictorial representations. The 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.

Abstract - this is the 'symbolic' stage. Children have the foundations firmly laid and should be able to move to an abstract approach using numbers and key concepts with confidence.

All classrooms have some concrete resources that can be used in the teaching of mathematics. Some more topic specific resources are located in the central maths store.

Bar Modelling

All teachers and learning support staff are trained in the Bar modelling approach (Trained April 2020). Bar modelling is a strategy used by children to visualise mathematical concepts and solve problems. The bar model method is pictorial - children draw bars to represent objects or quantities. As pupils develop an understanding of this method, they will be able to draw bars that are increasingly proportional; for example, a bar representing 20 cookies will be twice as long as a bar representing 10 cookies.

The particular power of the bar modelling pictorial approach is that it is applicable across a large number of topics. Once children have the basics of the approach secured, they can easily extend it across many areas. It should be noted that children need to have strategies to add, subtract, multiply and divide for them to use bar models. Bar models don't give a child an answer - they give them an understanding of what to do to get to the answer.

Planning

Teachers are provided with weekly Planning, Preparation and Assessment time (PPA) in order to carefully plan their curriculum. Teachers are released in year groups or phase teams to ensure continuity and progression across classes.

At Riverside Primary School we plan our mathematics at three levels:

Long Term Planning

The National Curriculum (2014) and Foundation Stage Curriculum defines the content that will be taught to each year group.

Medium Term Planning

Teachers follow the White Rose medium term planning, which provides the content for each term, based upon The National Curriculum (2014). In EYFS they create a medium term plan that is based on

The Foundation Stage Curriculum, ensuring that thorough coverage is combined with a creative and stimulating curriculum, Master the Curriculum is used to support this process.

Short Term Planning

Teachers produce a weekly plan on an approved school proforma. This identifies:

- • learning objectives
- • starting points
- • key vocabulary
- • teaching input and questions
- • differentiated activities
- • resources
- • assessment opportunities
- • the role of any LSAs

Weekly plans should also indicate specific support given to children with SEND. Paper copies of planning will be available in classrooms at all times, for additional members of staff, as well as shared electronically.

Our principal aim is to develop children's knowledge, skills and understanding in mathematics. We do this through a planned daily lesson that has a combination of whole-class and group-directed teaching.

- **Flashback 4** is used at the start of every maths lesson. It is used across the school to help ensure the essential skills are regularly revisited and retrieved to strengthen retention, supporting children's long term memory of maths concepts and skills.
 - The first question is likely to be something children did in the previous lesson.
 - The next question is something they did last week, to keep that ticking over.
 - The third and fourth questions are related to concepts they studied last month, or maybe much earlier in the year (or even last year)
 - **Starting points** are used in all KS2 classes to assess children's prior knowledge before starting a new area of maths. This helps teachers refine the teaching input and tasks to meet individual's needs, and supports children evaluate their progress within, or over several lessons.
 - **Models and images** are used to support the learning of mathematical concepts. All teachers and learning support staff are trained in the Bar modelling approach.
 - **'Steps to Success'** are created with the children to enable them to progress and achieve the given learning objective. Steps to Success are often displayed on the Working wall for future reference.
 - **Differentiation tasks** are planned to meet the needs of all children in the class. In most classes, children use self-assessment to select the starting level of their independent activity.
 - **Numicon** is used in EYFS and KS1 to support the teaching of a range of mathematical concepts.
- Base Ten Dienes and Place Value counters** are also used across KS1 and KS2.

During our daily lessons we encourage children to count aloud, practise fluency, problem solving and reasoning skills and ask mathematical questions. We develop their ability to independently select and use appropriate concrete apparatus to support their conceptual understanding and build procedural fluency. We develop the children's ability to represent problems using visualisation skills, including jottings and pictorial representations, which includes bar models. ICT is used in mathematics lessons for modelling ideas and methods. Wherever possible, we provide meaningful contexts and encourage the children to apply their learning to everyday situations. Although mathematics is mainly taught discretely, it has many cross-curricular links. Teachers need to use opportunities in other subjects to rehearse skills in context. Mathematics involves developing confidence and competence in number

work, geometry, measures and statistics and the using and applying of these skills.

The Early Years Foundation stage Curriculum feeds into the National Curriculum. It is good practice to make use of cross curricular links to enable children to use their learning in a real life context. Therefore, pupils should be given plenty of opportunities within sessions to use and apply the mathematical skills and concepts they have learned.

All classrooms, including EYFS have a designated area for mathematics equipment and resources, this also includes a Working Wall.

Working walls

- Working walls are to support pupils' learning and understanding in Maths
- Children are more likely to use and remember the working wall if they have been involved in generating some of the materials in the lessons (either as a whole class, group or individual)
- Working walls will be linked to planning, assessment, the teaching focus, targets etc. so will continuously evolve
- Working walls may not be neat / tidy / exact / pristine, as long as they are clear to the children and can be used
- Material on the working wall can be taken off the wall to be used in the lesson

An effective Maths Working Wall should:

- Show progression over time, being added to by both teacher and children.
- Link current work to previous skills taught to embed learning
- Identify and support particular learning needs of the class
- Include teacher and children's examples of 'What a good one looks like'
- Display Steps to Success, written with the children
- Be used for self and peer evaluation
- Show methods and steps visually

Maths Working Walls should include:

- Key Vocabulary
- Models and images
- Examples of children being successful.
- Steps to Success
- A successful example of what it would look like.
- Challenge
- Area to develop

Resources

Teachers draw from an extensive bank of resources within school. EYFS, Yr1 and Yr2 have class sets of Numicon - an additional set is available for interventions in KS2. Every KS1 class have large sets of numbers frames. Every KS2 class has a set of Base ten dienes apparatus. Everyday practical resources are based in the classroom, whilst other topic specific resources are stored in the maths cupboard located in the blue building and the maths resources area in the red building. These resources are neither exclusively Key Stage 1 nor Key Stage 2. Teachers freely select the apparatus they need to effectively deliver a concept.

Teachers use a variety of resources when planning, including White Rose and Master the Curriculum online resources and CGP textbooks. Teachers are also aware of a range of interactive activities and games that they can access, for example nrich and NCETM. All children have a login for Times Table Rock Stars. Many children in KS1 access 1 minute maths (WR) and in KS2 children have a login for Sumdog.

If new resources are purchased these are introduced to staff at the beginning of staff meetings by the maths lead, before being allocated to year groups or stored in the maths area.

Maths Meetings

Maths meetings take place across KS1 and KS2 and focus on mental maths strategies. These sessions are in addition to the daily maths lesson and vary in length and frequency, dependent on the year group. (Please see our Mental Maths Policy for more detail)

Targets

Individual targets are set at least every half term and shared with the children. The targets are found on a card, in the front of the child's maths books. A copy of the targets are shared with parents and taken home. These targets are addressed through whole class or group teaching during the maths lesson.

Setting or Mixed ability

Setting occurs from year 3, when year groups have more than one class. Children of similar abilities are taught together. In year 1 and 2 the children are taught in mixed ability classes or sets, depending on the needs of the cohort. Teachers consider the needs of all children and monitor their progress to ensure there is a positive impact on the progress of all children. Maths classes and sets are reviewed every half term. Parents are notified if their child moves maths class during the academic year.

Spoken language

The curriculum for mathematics will reflect the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof. They will be assisted in making their thinking clear to themselves, as well as others. Teachers will ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

Inclusion

All children receive high quality mathematics teaching on a daily basis and activities are differentiated accordingly. Guided maths is used as a tool to ensure focused intervention, based on the next steps for each group of children. In addition, where identified pupils are considered to require targeted support to enable them to work towards age appropriate objectives, second wave intervention programmes will be implemented. These include targeted maths groups led by LSAs, HLTAs or teachers. This could be a purchased intervention e.g. 1 min maths, Shine or booster groups taught by teachers during designated disadvantaged release time. Children, partially in year 6 are taught in smaller maths classes to improve progress rates. There will be a third wave of support for pupils who are placed on the school's SEND register, which will be additional and different, including individual maths support e.g. Plus 1 and Power of 2. We ensure that all SEND and PPG children's needs are met through carefully selected resources, LSA support and interventions. Please see our separate SEND and PPG policies for further information.

Pupils that show a particular gift in mathematics will be identified and supported in line with our Teaching and Learning policy.

Equal opportunities

All pupils, regardless of gender, race or learning needs will be given equal access to the mathematics curriculum. The curriculum will be differentiated according to the needs of the pupils. Resources will reflect the needs of all our children. Analysing pupil performance throughout the school ensures that there is no disparity between groups.

Impact

Assessment

Assessments are made in line with the school assessment policy. Assessment for learning is fundamental

to raising standards and enabling children to reach their potential. Assessment in mathematics takes place daily using a range of strategies such as marking and feedback of work and verbal discussions with children.

Children are assessed on entering the school and statutory assessments are carried out at the end of EYFS, Key Stage 1, Key Stage 2 and in year 4 in the summer term. Key stage 1 takes the form of tests and ongoing teacher assessment. Key Stage 2 sit three timed papers in an assessment week. Children in year 4 take an online Multiplication Timestable Check. Children in EYFS are assessed through ongoing observation and analysis. Teachers use assessment for learning to ensure planning is based on prior attainment and that pupils know what they need to do to achieve the next steps.

Summative assessments are regularly used to ascertain children's understanding. End of unit assessments are used as a way of recording children's progress against objectives covered in a specific unit. Termly assessments are used to assess against end of year outcomes and produce individual scaled scores. Yr3,4 and 5 use the NTS maths assessment and in yr2 and yr6 past end of Key Stage assessments are used. These scaled scores are recorded on FFT where the data can be analysed. In yr1 the White Rose end of term assessments are used with a view to trailing the NTS. Teachers evaluate the progress and attainment of each child to ensure future planning and resourcing, including adults and differentiated work, meet the needs of each pupil. Teachers evaluate the success of any provision delivered in the class. Interventions outside the class are also evaluated.

Formative assessment is used by all adults in the maths class. It is an integral and continuous part of the teaching and learning process at Riverside and much of it is done informally as part of each teacher's day to day work. Teachers integrate the use of formative assessment strategies, such as; effective questioning; clear learning objectives; the use of starting points and steps to success; effective feedback written/verbal and observing children participating in activities. This formative assessment helps teachers to reshape lessons; it informs their future planning, provision and resources.

Children are encouraged to read and respond to their marking. This marking enables children to understand where they have gone wrong and what their next steps in learning are. Children regularly assess their own work and that of their peers.

Personal targets and progress in mathematics are reported three times a year to parents (Two parent's evenings and in the end of year report.) In addition, individual targets in mathematics are updated at least half-termly.

Teachers analyse data to identify whole class and individual areas of strength or areas to develop at the end of a unit of work. In addition, the teacher keeps individual records of children's attainment and progress. These include any information that enables the teacher to deliver an effective, relevant curriculum which builds on prior attainment and meets the needs of pupils.

Leadership and Management

The subject leader's role is to empower colleagues to teach mathematics to a high standard and support staff in the following ways:

- Attending subject leader update meetings; keeping up to date on current issues; disseminating relevant information and providing training for staff members (either directly or through other professionals)
- Leading by example by modelling lessons or styles of teaching
- Having a secure knowledge of the quality of mathematics provision across the school and using this to provide a coaching and mentoring role

- Identifying and acting on development needs of staff members
- Monitoring expectations, provision and attainment across the school and providing feedback to develop practice further in order to raise standards
- Analysing whole school data, identifying strengths and areas to develop and monitoring specific groups.
- Assisting with requisition and maintenance of resources required for the teaching of mathematics.
- Liaising with Phase leaders to ensure effective provision across the school
- Providing induction for new members for teaching staff.

Monitoring and Evaluation

The quality of teaching and learning is monitored as part of the appraisal process through lesson observations and through the progress and attainment documents. In addition, continuity and progression across the school is monitored by the mathematics subject leader as is the implementation and impact of Assessment for Learning. The Mathematics action plan, which is linked to the School development plan, identifies actions intended to raise standards.

At Riverside Primary School we maintain an identified governor for mathematics who is invited to attend relevant school INSET. The Mathematics governor meets at least termly with the subject leader to review progress.

Parental/Community involvement

We value parent involvement in children's development of mathematics and promote a home school partnership in the following ways:

- Sharing information – newsletters, the school website, curriculum workshops and evenings, parent leaflets, year group parent meetings, maths and english targets home termly.
- Celebrations – achiever of the week, Sumdog certificates, TTRS certificates, showcases, displays.
- Homework - in line with our homework policy and home/school agreement.
- Supporting their child's development through Parents' Evenings, SEND meetings.
- Parents are welcomed into the school to support children in mathematics through 'Shared Learning' sessions.
- We have established links with local playgroups and secondary schools to ensure smooth transition between phases of education.
- Sumdog club and TTRS – online maths competitions which children can take part in, at school and at home.