

The Royal School (Crown Aided)



Curriculum Area - Mathematics

Date Reviewed October 2021

Next Review: This is a live policy and the Headteacher is responsible for maintaining its accuracy. Any required amendments should be sent direct to the document owner.

Introduction

At The Royal School, we understand the importance of a well-rounded, fulfilling curriculum to prepare our pupils for the next stage of education, and for their present and future role as global citizens. Maths is an essential part of our curriculum as it equips children to make sense of the world around them. It forms part of a knowledge base to help us understand our place in the world. We support children's developing agency in maths by giving time, space and support for children to contribute and develop their own ideas.

The Royal School Curriculum uses the National Curriculum of England to outline the knowledge and skills base of the maths curriculum.

Our school mission and vision shape all areas of The Royal School Curriculum.

Our **mission statement** describes how we do things at The Royal School on a daily basis. We are:

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Our **vision statement** describes where we are heading and outlines our purpose – the reason why we do things at The Royal School.

At The royal school our vision is to light up our communities and the world through being - big Thinkers – resourceful - independent and resilient - generous of spirit - honest and - team players

Our school mission statement and vision statement encapsulate the ethos that is held consistently by all members of our learning community. It was created and developed by us all over the period between 2016 and 2020, and it underpins everything that goes on at The Royal School., including the development of The Royal School Curriculum

We have a growth mindset (Dweck, 2006) in our school, and our vision although unique to our context draws from concepts for curriculum development in Guy Claxton's and Bill Lucas' "Seven Cs" (Claxton & Lucas, 2015). Alongside this, The Royal School Curriculum draws from curriculum ideals for the future of education developed by the OECD in the 2030 Education project (OECD, n.d.)

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The Royal School Vision within the Maths curriculum		
	How does this show in our curriculum and pedagogy?	What does this mean to the Royal School Maths curriculum?
Big Thinkers	<p>We are committed to learning and children will get the opportunity to try things over again many times and learn from both mistakes and successes.</p> <p>Our curriculum supports us to be expert communicators of ideas.</p> <p>Our curriculum gives us the opportunity to, be reflective, think deeply, practice different types of thinking and develop metacognitive skills.</p>	<p>Children are encouraged to reflect on their own thinking in understanding a mathematical context.</p> <p>They are supported to talk about the process of maths and how they could solve a problem in different ways.</p> <p>Children are supported to think about and use developing mathematical skills to solve real world maths problems.</p>
Resourceful	<p>Our curriculum helps us to look after the things that we have.</p> <p>It gives us opportunities to be curious and develop our own line of questions.</p> <p>We often get the chance to go from an idea to reality (being creative).</p> <p>We know that today matters for every pupil and regardless of age we can create and contribute to change with our own ideas</p>	<p>We expect children to care for resources within maths and to follow instructions for their careful use.</p> <p>We use recycled materials within maths whenever possible.</p> <p>Children are encouraged to communicate ideas around sustainability mathematically.</p>
Independent and resilient	<p>Our curriculum gives us the opportunity to try things for ourselves and be confident as learners.</p> <p>We value learning from mistakes, and it builds our confidence to try something again.</p> <p>We encourage opportunities for self-discipline.</p> <p>We say yes to challenge.</p> <p>We don't say "can't," we say "not yet"</p>	<p>We view maths as a process with many ways to work out a correct answer. We encourage children to try and trial many different ways.</p> <p>We discourage the use of erasers when solving a problem in maths.</p> <p>We celebrate incorrect answers as they are part of the journey to a correct answer.</p> <p>We give opportunity for quiet independent work within maths lessons.</p>
Generous of spirit	<p>Our curriculum gives opportunities for us to give of our time and talents to benefit others.</p> <p>We learn to look for those whose voice may not be heard and use our time and talents to give a voice when we can.</p> <p>We believe that the opportunities to recognize social injustice and to think creatively about working towards social justice is part of a balanced education.</p> <p>We believe children can contribute to society as children – they do not need to wait to participate.</p>	<p>We encourage the use of logical thinking reflective of mathematics when considering social injustice.</p>
Honest	<p>Our curriculum gives opportunities to be honest with ourselves (looking after our own well-being and mental health) and to be honest with others to promote and facilitate collaboration</p>	<p>Children are scaffolded to self and peer review the process of problem solving.</p>
Team Players	<p>Our curriculum promotes team building skills to work together so that all achieve</p>	<p>Children collaborate to solve problems.</p> <p>Children share resources. They work together supporting those around them.</p>

Aim

The aim of this policy is to:

- enable every individual regardless of ability to achieve their full potential in a safe and secure learning environment
- ensure that pupils have access to a consistent high standard of education in Mathematics teaching and learning.

Definition

Mathematics is a creative and highly interconnected 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 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 develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- 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

NATIONAL CURRICULUM

Teachers are expected to have a good knowledge of the programmes of study and attainment criteria relevant to the age groups they are teaching and the age group below and above the one they are teaching.

Statutory requirements for the teaching and learning of Mathematics are set out in the Early Years Foundation Stage Statutory Framework and the 2014 National Curriculum Mathematics Programmes of Study for Key Stage 1 and Lower Key Stage 2.

The programmes of study for Key Stage 1 and Lower Key Stage 2 are organised into seven distinct domains. The seven domains are Number and Place Value, Addition and Subtraction, Multiplication and Division, Fractions, Measurement, Geometry (Properties of Shape and Position and Direction) and Statistics.

KEY STAGE 1

The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This involves working with numerals, words and the 4 operations, including with practical resources [for example, concrete objects and measuring tools].

At this stage, pupils should develop their ability to recognize, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.

Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

LOWER KEY STAGE 2

The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the 4 operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.

By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12-multiplication table and show precision and fluency in their work.

Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word-reading knowledge and their knowledge of spelling.

Organisation of Teaching and Learning

At The Royal School, we follow a - **concrete, pictorial and abstract approach**. This means that across all areas of maths, children will experience using resources and real objects before learning how these would be represented in pictures. Finally, when they are ready, they will move onto the abstract/traditional calculation.

Children are given the opportunity to become fluent with a concept or area of maths. i.e. they learn to do the calculation or question, as well as being given a chance to reason and problem solve, to further develop their mathematical skills and use their understanding in a range of contexts.

We use the White Rose Maths Hub schemes of learning to guide our maths planning and ensure that lessons follow a systematic progression of skills. We draw lessons from White Rose as well of a wide range of resources to ensure that maths is enjoyable and achievable to all children in the class. w

Children in Reception and KS1 have opportunities to consolidate and extend their learning through continuous provision.

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We encourage children in foundation stage, KS1 and KS2 to play and experiment with maths. This is facilitated by readily available maths equipment, open ended questions, the use of maths games and play equipment available in outdoor areas that promote maths.

The time spent on focused mathematics teaching is approximately 30 minutes to one hour a day. Sometimes, lessons may be blocked together for extended sessions rather than teaching being limited to just one hour per day. Teaching methods are varied according to need and teacher preference at any given time, the activity under consideration and the location of such an activity will be considered. At both key stages' mathematics will be taught as activities for a whole class, small group or individuals as appropriate.

There are children of differing ability in all classes at The Royal School. We recognise this fact and provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this through a range of strategies. In some lessons we do it through differentiated group work, while in other lessons we ask children to work from the same starting point but differentiate by the level of expectations, whether they be more able and talented or requiring learning support. Classroom assistants assist some children, to meet lesson objectives with guided support.

Resources

There are a range of resources available to support the teaching of mathematics across the school and teachers choose the resources that suit the learners in that class. We have a central store of maths equipment and are working towards a more extensive store of maths equipment within each classroom. Across the school we follow the White Rose Maths overview but this is seen as a tool rather than a scheme to follow exactly, teachers do have access to the White Rose videos and worksheets. Children from Year 1 upwards have a Mathletics account and this is used for both homework and in class work. Children from Year 2 have a timetables Rockstar account.

Children in KS1 have a maths folder to keep maths work in. While children in KS2 work in squared maths books.

Maths Curriculum Planning

Maths is a core subject in the National Curriculum. We use the National Curriculum as the basis for implementing the statutory requirements of the programme of study for Maths.

We carry out the curriculum planning in Maths in three phases: a long-term overview across the year, a mid-term topic-based plan (either 6 or 12 weeks) and detailed weekly plans. We identify the key objectives in Maths that we should teach to each year group. Additionally, we identify the key objectives in Maths in other year groups to ensure the needs of all pupils are met, whether they be more able and talented or requiring additional learning support. Lesson objectives are from the year level of the class, however teachers will at times plan assessment and extension activities that allow us to identify if pupils have grasped concepts beyond their current year level.

Each year's overview defines what we teach and ensures an appropriate balance and distribution of work across each term. The maths leadership area covers the maths curriculum, mathematical elements of the Early Years Framework and speaking and listening. The area of "Speaking and Listening" from the English curriculum is seen as the basis of language development and crucial to the development of all subject areas. It is tracked and reviewed by The Headteacher along with all subject area middle leaders.

Class teachers complete a weekly (short-term) plan for the teaching of Maths. This lists the specific learning objectives for each lesson and gives brief details of how the lessons are to be taught. It also includes brief details of what each group of children will be learning and their independent task. Differentiation is also noted. Whilst we do not require detailed weekly plans to be written, lessons must be planned in detail and this should be apparent in all informal and formal lesson observations. The weekly plans are uploaded to the shared drive by Thursday 3.30pm the week preceding teaching and also kept by the class teacher as an annotated working document to be used as part of a reflective planning process. Teachers reflect on pupil learning, assess on an ongoing basis and use target tracker gap analysis on a regular basis (weekly or at least per twice per short term) to guide planning.

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Assessment and recording

Teachers assess children's work in Maths continually. The daily assessments that teachers make as part of every lesson allows them to adjust their teaching and planning for subsequent lessons. Teachers match these short-term assessments closely to the teaching objectives. Target Tracker statements are used continually as an assessment aid by teachers to measure progress against the key objectives and to help them plan for the next unit of work.

Pupils are supported in self-assessment by the use of WALT (we are learning today) statements and individual target sheets. Children may be working on a WALT over a number of lessons and curriculum areas.

Pupils complete assessments during each term; these contribute to teachers' observations in order to monitor each child's progress against school and national targets. They are also used to inform and summarise learning for oral reports. Year-end assessments enable teachers to set targets for the next school year and help teachers to summarise the progress of each child for end-of-year reports. The next teacher uses these end of year assessments as the basis for planning work and class groupings for the new school year. Assessments are made against the year's target tracker statements through work completed in books, practical activities, discussions and observation of maths in use.

During periods of remote learning we use white rose worksheet books as part of the lesson to support children's learning at a distance.

Teachers meet regularly to moderate assessment and review pupils' work against the objectives and expectations outlined in the national curriculum.

EQUAL OPPORTUNITIES

All pupils have an entitlement of access to the National Curriculum. Equal opportunities are considered when we decide upon the resources we provide and the teaching strategies we employ. In our curriculum planning we ensure that all pupils, with due respect to their culture, religion and background, have equal access to all areas of the curriculum, extra-curricular activities, all areas of the grounds, equipment and resources, the staff, and time to contribute to the whole class and group work.

SPECIAL NEEDS

Classroom support for those children who find learning difficult is provided through differentiated planning, appropriate resources and teaching assistant and teacher support.

GIFTED AND TALENTED

Classroom support for those children who share a special aptitude and potential in mathematics is provided through differentiated planning, appropriate resources and teaching assistant and teacher support.

DIFFERENTIATION

Teachers should use a variety of differentiation strategies including:

- use of stepped activities which become more difficult and demanding but cater for the less able in the early sections
- use of common tasks which are open ended activities or investigations where differentiation is by outcome
- differentiating by the resources they provide to pupils e.g. support could be provided in the form of counters, cubes, 100 squares or number lines
- using ability grouping so that the groups can be given different tasks

EARLY YEARS FOUNDATION STAGE

The Early Years Foundation Stage (EYFS) will provide children with an opportunity to explore and experiment with a wide variety of resources and tools in this subject area. The EYFS follow the national expectations laid out in the EYFS documentation, culminating in the end of Foundation Stage

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expectations. Staff plan activities and experiences that promote children's development and learning based on the Early Learning Goals outlined in the Foundation Stage Profile 2020. Mathematics is a specific area of learning for the EYFS which involves providing children with opportunities to develop and improve their skills in counting, understanding and using numbers, calculating simple addition and subtraction problems; and to describe shapes, spaces, and measures.

COMPUTING AND USE OF INFORMATION TECHNOLOGY

Computing has deep links with mathematics and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content across the curriculum.

Calculators should not be used as a substitute for good written and mental arithmetic. They should therefore only be introduced near the end of key stage 2 to support pupils' conceptual understanding and exploration of more complex number problems, if written and mental arithmetic are secure. At The Royal School children may at times use calculators and ICT to assist in working through some "real world" problems.

Statutory End of Key Stage Assessment

Statutory National Curriculum tests are used at the end of KS1.

MONITORING AND EVALUATION

The Subject Leader is responsible for reviewing long term planning to ensure appropriate coverage. They will support teachers in the medium planning process to ensure high quality resourcing, teaching and learning in their subject area. They will review whole school performance in their subject area and provide an end of year review, including areas for development, for submission to the school development plan. They will review children's work in this area, assist in moderation of judgments across the school and maintain an up to date subject leader file.

This policy should be read in conjunction with the current maths progression map and the marking and feedback policy.

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