

**Policy: Mathematics**

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| **Headteacher** | **L Jones** |
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## **Statement of intent**

**Royd Nursery Infant School** recognises that maths is both a key skill within school, and a life skill to be utilised through everyday experiences. A high-quality maths education provides a firm foundation for understanding how maths is used in everyday life and activities, developing pupils’ ability to reason mathematically.

Through the teaching of maths, we aim to develop:

* A positive attitude towards maths and an awareness of the relevance of maths in the real world.
* A process of enquiry and experiment.
* An ability to solve problems and think logically in order to work systematically and accurately.
* An ability to work both independently and in cooperation with others.
* Competence and confidence in pupils’ maths knowledge, concepts and skills.
* An appreciation of the creative aspects of maths and an awareness of its aesthetic appeal.

# Legal framework

* 1. This policy has due regard to statutory guidance including, but not limited to, the following:
* DfE (2013) ‘National curriculum in England: Mathematics programmes of study’
* DfE (2017) ‘Statutory framework for the early years foundation stage’

# Roles and responsibilities

* 1. The **Mathematics subject leader and curriculum team** is responsible for:
* Preparing policy documents, curriculum plans and schemes of work for the subject.
* Reviewing changes to the national curriculum and advising on their implementation.
* Monitoring the learning and teaching of maths, providing support for staff where necessary.
* Ensuring the continuity and progression from year group to year group.
* Encouraging staff to provide effective learning opportunities for pupils.
* Helping to develop colleagues’ expertise in Mathematics.
* Organising the deployment of resources and carrying out an **annual** audit of all maths-related resources.
* Liaising with teachers across all phases.
* Communicating developments in the subject to all teaching staff.
* Leading staff meetings and providing staff members with the appropriate training.
* Organising, providing and monitoring CPD opportunities in the subject.
* Ensuring common standards are met for recording and assessing pupil performance.
* Advising on the contribution of maths to other curriculum areas, including cross-curricular and extra-curricular activities.
* Collating assessment data and setting new priorities for the development of maths in subsequent years.
  1. The **classroom teacher** is responsible for:
* Acting in accordance with this policy.
* Ensuring progression of pupils’ mathematical skills, with due regard to the national curriculum.
* Planning lessons effectively, ensuring a range of teaching methods are used to cover the content of the national curriculum.
* Liaising with the **Mathematics subject leader and curriculum team** about key topics, resources and support for individual pupils.
* Monitoring the progress of pupils in their class and reporting this to parents **each term**.
* Reporting any concerns regarding the teaching of the subject to the **Mathematics subject leader and curriculum team** or a member of the **senior leadership team (SLT)**.
* Undertaking any training that is necessary in order to effectively teach the subject.
  1. The **special educational needs coordinator (SENCO)** is responsible for:
* Liaising with the subject leader in order to implement and develop maths throughout the school.
* Organising and providing training for staff regarding the maths curriculum for pupils with special educational needs and disabilities (SEND).
* Advising staff how best to support pupils’ needs.
* Advising staff on the inclusion of mathematical objectives in pupils’ individual education plans.
* Advising staff on the use of teaching assistants in order to meet pupils’ needs.

# The curriculum

* 1. The school aims to assist pupils in achieving attainment targets set out in the national curriculum. By the end of each key stage, pupils are expected to know, apply and understand the matters, skills, and processes specified in the national curriculum. Pupils will learn a broad range of subject knowledge and draw on disciplines such as maths, science, computing and art.

**EYFS**

* 1. All pupils in the EYFS are taught Mathematics as an integral part of the topic work covered during the academic year.
  2. All Mathematics objectives within the EYFS are underpinned by the following three prime areas outlined in the ‘Statutory framework for the early years foundation stage’:
* Communication and language
* Physical development
* Personal, social and emotional development
  1. There are four specific areas through which the three prime areas are strengthened and applied:
* Literacy
* Mathematics
* Understanding the world
* Expressive arts and design
  1. The Mathematics curriculum in the EYFS focusses on the specific areas of number and shape, space and measure.
  2. During the early years foundation stage, pupils will be taught to:
* Count with numbers from 1 to 20, placing them in order and naming the number that is one more or less than a given number.
* Use quantities and objects to add and subtract two single-digit numbers, and count forwards or backwards to find the answer.
* Solve problems, including doubling, halving and sharing.
* Use everyday language to talk about size, weight, capacity, position, distance, time and money in order to compare quantities and objects, and solve problems.
* Recognise, create and describe patterns.
* Use mathematical language to describe everyday objects and shapes.

**KS1**

* 1. **In Year 1, pupils will be taught to:**
* **Number and place value**
* Count to 100, forwards and backwards, beginning with 0 or 1, from any number.
* Count, read, and write numbers from 1 to 100.
* Count in multiples of 2, 5, and 10.
* Identify one more and one less from a number.
* Identify and represent numbers using objects and pictures (using a number line) and use language of: equal to, more than, less than (fewer), most, least.
* Read and write numbers from 1 to 20 in numerals and words.
* **Addition and subtraction**
* Read, write, and interpret statements involving addition, subtraction, and equals signs.
* Represent and use number bonds and related subtraction facts within 20.
* Add and subtract one and two-digit numbers to 20, including 0.
* Solve one-step problems which involve addition and subtraction.
* **Multiplication and division**
* Solve one-step problems using multiplication and division, calculating the answer using concrete objects and pictorial representations.
* **Fractions**
* Recognise, find and name a half as 1 of 2 equal parts.
* Recognise, find and name a quarter as 1 of 4 equal parts.
* **Measurement**
* Compare, describe and solve practical problems for lengths and heights, weight, time, capacity and volume.
* Measure and begin to record lengths and heights, weight, time, capacity and volume.
* Recognise and know the value of different denominations of coins and notes.
* Sequence events in chronological order using language.
* Recognise and use language relating to dates, including days of the week, weeks, months, and years.
* Tell the time to the hour and half past the hour, and draw the hands on a clock face to show these times.
* **Properties of shapes**
* Recognise and name common 2D and 3D shapes.
* **Position and direction**
* Describe position, direction and movement, including whole, half, quarter and three-quarter turns.
  1. **In Year 2, pupils will be taught to:**
* **Number and place value**
* Count in steps of two, three and five from 0, and in 10s from any number, forwards and backwards.
* Recognise the place value of each digit in a two-digit number.
* Identify, represent and estimate numbers using different depictions, including the number line.
* Compare and order numbers from 0 to 100, using <, > and = signs.
* Read and write numbers 1 to 100 in numerals and words.
* Use place value and number facts to solve problems.
* **Addition and subtraction**
* Solve problems with addition and subtraction using concrete objects and pictorial representations.
* Apply increasing knowledge of mental and written methods.
* Recall and use addition and subtraction facts to 20, and derive and use related facts up to 100.
* Add and subtract numbers using concrete objects, pictorial representations, and mentally – including a two-digit number and 1s, a two-digit number and 10s, two two-digit numbers, and adding three one-digit numbers.
* Show that the addition of two numbers can be done in any order and subtraction of one number from another cannot.
* Recognise and use the inverse relationship between addition and subtraction, and use this to check calculations and solve missing number problems.
* **Multiplication and division**
* Recall and use multiplication and division facts for the 2, 5, and 10 multiplication tables.
* Recognise odd and even numbers.
* Calculate mathematical statements for multiplication and division within the multiplication tables and write them using x, ÷, and = signs.
* Show that multiplication of two numbers can be done in any order, and division of one number by another cannot.
* Solve problems involving multiplication and division using materials, arrays, repeated addition, mental methods, and multiplication and division facts.
* **Fractions**
* Recognise, find, name, and write fractions of a length, shape, set of objects or quantity.
* Write simple fractions and recognise their equivalence, e.g. and .
* **Measurement**
* Choose and use appropriate standard units to estimate and measure length/height in any direction, mass, temperature, and capacity to the nearest appropriate unit.
* Compare and order lengths, heights, mass, volume/capacity, and record the results using >, < and =.
* Recognise and use symbols for pounds (£) and pence (p), and combine amounts to make a particular value.
* Find different combinations of coins that equal the same amounts of money.
* Solve simple problems in a practical context, e.g. giving change.
* Compare and order intervals of time.
* Tell and write the time to five minutes, including quarter past/to the hour, and draw the hands on a clock face to show these times.
* Know the number of minutes in an hour and the number of hours in a day.
* **Properties of shapes**
* Identify and describe the properties of 2D shapes, including the number of sides, and line symmetry in a vertical line.
* Identify and describe the properties of 3D shapes, including the number of edges, vertices and faces.
* Identify 2D shapes on the surface of 3D shapes.
* Compare and sort common 2D and 3D shapes using everyday objects.
* **Position and direction**
* Order and arrange combinations of mathematical objects in patterns and sequences.
* Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line, distinguishing between rotation as a turn, and in terms of right angles for quarter, half and three-quarter turns.
* **Statistics**
* Interpret and construct simple pictograms, tally charts, block diagrams and tables.
* Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity.
* Ask and answer questions about totalling and comparing data.

# Cross-curricular links

* 1. Wherever possible, the maths curriculum will provide opportunities to establish links with other curriculum areas.
  2. **English**
* Mathematical terminology is used, where appropriate.
* Maths-based texts are sometimes used in English lessons and in guided reading lessons.
  1. **Science**
* Pupils’ data collection and analysis skills are further developed through the conduction of physical experiments, using units of measurement, calculating averages and interpreting results.
* Pupils record their finding using charts, tables and graphs.
  1. **Humanities**
* Data analysis, pattern seeking and problem-solving skills are developed through the teaching of geography.
* Pupils’ understanding of time and measurements of time are developed through discussions of historical events.
  1. **Computing**
* Pupils are encouraged to use calculators and other electronic devices, gaining confidence throughout their school experience.
* Computing will be used to enhance pupils’ maths skills through the use of online resources and the creation of spreadsheets.
* Computing will be used to record findings, using text, data and tables.

# Teaching and learning

* 1. The KS1 Mathematics curriculum is delivered as follows:

Number Ninjas

This structure was created by the **Mathematics subject leader and curriculum team** to ensure all pupils are exposed to the full National Curriculum within a two-week repeated cycle. This ensures over-learning in all pupils through continuous re-visiting of all mathematics areas independent of when it is taught within the academic year (Money is taught in the Summer term; however, it is still visited in Number Ninjas from Autumn term). Number Ninjas involves high-quality questioning, opportunities to reason and repetition of learning delivered in a fast-paced, engaging routine.

Mathematics Lessons

Mathematics lessons take place four times per week for a duration of 1 hour per lesson. Each lesson is structured to implement 10 minutes of Number Ninjas teaching prior to transitioning into the main lesson objective for that day. The sequence of learning has been developed by the **Mathematics subject leader and curriculum team.** Because Number and Place value underpins all mathematical enquiry, this area of learning is taught first throughout the Autumn term. This is followed by Shape, Space and Measure, Addition and Subtraction, Multiplication and Division, Fractions and Money.

Mental and Oral Maths

These lessons are delivered three times per week for a duration of 30 minutes per lesson using the scheme “Big Maths”.

* 1. Pupils will be taught to describe key characteristics and associated processes in common language, as well as understand and use technical terminology and specialist vocabulary.
  2. Pupils will undertake independent work, and have the opportunity to work in groups and discuss work with fellow classmates.
  3. Lessons will allow for a wide range of mathematical, enquiry-based research activities, including the following:
* Questioning, predicting and interpreting
* Pattern seeking
* Collaborative work
* Problem-solving activities
* Classifying and grouping
  1. Lessons will involve the use of a variety of sources, including data, statistics, graphs and charts.
  2. The **classroom teacher**, in collaboration with the **Mathematics subject leader and curriculum team**, will ensure that the needs of all pupils are met by:
* Setting tasks which can have a variety of responses.
* Providing resources of differing complexity, according to the ability of the pupils.
* Setting tasks of varying difficulty, depending on the ability group.
* Utilising teaching assistants to ensure that pupils are effectively supported.
  1. A maths mastery approach is taken to the curriculum, in which fluency comes from deep knowledge and practice. This means that structured questioning is used to ensure that pupils develop fluent technical proficiency and think deeply about the underpinning mathematical concepts.
  2. Focus is put on the development of deep structural knowledge and the ability to make connections, with the aim of ensuring that what is learnt is sustained over time.
  3. At **Royd Nursery Infant School**, we do not prioritise between technical proficiency and conceptual understanding, and we aim to develop these in parallel.
  4. As part of Mathematics, pupils are provided with a Mathematics book, which they are required to present their work in. The books are used to evidence pupils’ responses.
  5. Mathematics books are an essential record of individual pupils’ experiences and ideas throughout a year, and will be seen as evidence for assessment and reporting purposes.
  6. Displays of Mathematics based work will feature on the Mathematics Wall and are used to celebrate achievement and support teaching and learning.
  7. The school promotes displays of Mathematics based work on topic displays in classrooms to influence how pupils feel about their environment, convey standards and promote high expectations.
  8. Displays are used to communicate ideas, stimulate interest, celebrate pupils’ work, reflect the ethos of the school and respond to pupils’ interests.

# Planning

* 1. All relevant staff members are briefed on the school’s planning procedures as part of staff training.
  2. Throughout school, Mathematics is taught as a discrete lesson and as part of cross-curricular themes when appropriate.
  3. Teachers will use the key learning content in the DfE’s ‘Mathematics programmes of study: key stages 1 and 2’ and the national curriculum as a starting point for their planning.
  4. Issues of health and safety are addressed in the planning and delivery of the Mathematics curriculum.
  5. Lesson plans will demonstrate a balance of interactive and independent elements used in teaching, ensuring that all pupils engage with their learning.
  6. Lesson plans will demonstrate the balance of visual, auditory and kinaesthetic elements used in teaching, ensuring that all pupils with different learning styles can access the learning experience.
  7. There will be a clear focus on direct, instructional teaching and interactive oral work with the whole class and targeted groups.
  8. The school creates long-term, medium-term and short-term plans for the delivery of the Mathematics curriculum – these are as follows:
* Long-term: includes the topics studied in each term during the key stage
* Medium-term: includes the details of work studied each term
* Short-term: includes the details of work studied during each lesson
  1. The **Mathematics subject leader and curriculum team** is responsible for reviewing and updating long-term and medium-term plans, and communicating these to teachers.
  2. Teachers are responsible for reviewing and updating short-term plans, building on the medium-term plans, taking into account pupils’ needs and identifying the methods in which topics could be taught.
  3. Long-term planning will be used to outline the units to be taught within each year group.
  4. Medium-term planning will be used to outline the vocabulary and skills that will be taught in each unit of work, as well as highlight the opportunities for assessment.
  5. Medium-term plans will identify learning objectives, main learning activities and differentiation.
  6. Medium-term plans will be shared with the **Mathematics subject leader and curriculum team** to ensure there is progression between years.
  7. Short-term planning will be used flexibly to reflect the objectives of the lesson, the success criteria and the aims of the next lesson.
  8. All lessons will have clear learning objectives, which are shared and reviewed with pupils.
  9. All Mathematics activities are built so that they build upon a pupil’s prior knowledge. All pupils of all abilities are provided with the opportunity to develop their skills, knowledge and confidence, ensuring progression through increasing class challenges.

# Assessment and reporting

* 1. Pupils will be assessed and their progression recorded in line with the school’s **Assessment Policy**.
  2. Pupils aged between two and five will be assessed in accordance with the ‘Statutory framework for the early years foundation stage’, in order to identify a pupil’s strengths and identify areas where progress is less than expected.
  3. An EYFS Profile will be completed for each pupil in the final term of the year in which they reach age five.
  4. The progress and development of pupils within the EYFS is assessed against the early learning goals outlined in the ‘Statutory framework for the early years foundation stage’.
  5. Throughout the year, teachers will plan on-going creative assessment opportunities in order to gauge whether pupils have achieved the key learning objectives.
  6. Assessment will be undertaken in various forms, including the following:
* Talking to pupils and asking questions
* Discussing pupils’ work with them
* Marking work against the learning objectives
* Pupils’ self-evaluation of their work
* Classroom tests and formal exams
  1. Teachers will record pupils’ ability and progression through two types of assessment – formative and summative.
  2. Formative assessment, which is carried out informally throughout the year, enables teachers to identify pupils’ understanding of subjects and inform their immediate lesson planning.
  3. In terms of summative assessments, the results of end-of-year assessments will be passed to relevant members of staff, such as the pupil’s future teacher, in order to demonstrate where pupils are at a given point in time.
  4. Standardised tests will be used at four points of the academic year, to measure each pupil’s attainment in all areas of Mathematics. These results will be compared with an ‘average’ for all pupils of that age.
  5. Parents will be provided with a written report about their child’s progress during the **Summer** term every year. These will include information on the pupil’s attitude towards maths, and their progress. Two personalised Mathematics targets will be provided for the pupil to work on at home. An opportunity will be provided for parents to discuss this report with the relevant teachers.
  6. Verbal reports will be provided at parent-teacher interviews during the **Autumn** and **Spring** terms.
  7. The progress of pupils with SEND will be monitored by the **SENCO**.

# Resources and equipment

* 1. The **Mathematics subject leader and curriculum team** is responsible for the management and maintenance of maths resources, as well as for liaising with the **SLT** in order to purchase further resources.
  2. Maths resources will be stored in **each classroom**, including calculators, rulers and protractors.
  3. Resources which are not required regularly, and those in relation to key whole-school topics, will be stored in the **resource room**.
  4. Display walls will be utilised and updated regularly, in accordance with the area of maths being taught at the time.
  5. Maths equipment and resources will be easily accessible to pupils during lessons.
  6. The **Mathematics subject leader and curriculum team** will undertake an audit of maths equipment and resources on an **annual** basis.

# Health and safety

* 1. Staff members will act in accordance with the school’s Health and Safety Policy at all times.
  2. Accidents and near-misses will be reported following the procedure outlined in the school’s Accident Reporting Procedure Policy.
  3. All staff members will be shown how to correctly use equipment as part of their induction training.
  4. Any ‘new’ activities which a teacher has not used in the classroom before will be trialled prior to being performed with pupils.
  5. Pupils are allowed full access to a wide range of materials in art, to maximise their learning experience; however, health and safety concerns are inherent with this subject, including storing materials and tools, and the use of equipment.
  6. PPE, such as gloves and eye protection, is made available to all pupils and teachers where required.
  7. The risks of each task and the tools required will be assessed by the **classroom teacher** and **Mathematics subject leader and curriculum team** before lessons, and relevant PPE will be compulsory based on their decisions.
  8. All tools and equipment will be checked before the start of every lesson by the **classroom teacher**.
  9. Pupils will be taught to use tools and equipment properly by the **classroom teacher** before use. They will also be fully briefed on the importance of how to correctly use tools and equipment.
  10. All tools and equipment are stored in the **resource room** at the end of each day. Classrooms are **not accessed during lunch and break times by children** to prevent unsupervised access to potentially harmful tools or equipment.

# Homework

* 1. Homework will be set on a **weekly** basis and will follow and build upon curriculum content. The content of the Mathematics homework will be decided by the class teacher and monitored by **SLT.** Throughout the academic year there will be a range of homework provided linked to differing subjects.
  2. Homework will be varied according to the different abilities of pupil – this includes difficulty and the time required to complete work.
  3. Homework will focus on numerous aspects of Mathematics, for example, multiplication, and Addition and Subtraction etc.

# Equal opportunities

* 1. We are an inclusive school that ensures all pupils are provided with equal learning opportunities, regardless of social class, gender, culture, race, disability or learning difficulties. Our **Equal Opportunities Policy** ensures all pupils are able to achieve their potential in all areas of the curriculum.
  2. In order to ensure pupils with SEND achieve to the best of their ability, outcomes are adapted, and the delivery of the Mathematics curriculum is differentiated for these pupils, in line with the school’s **SEND Policy**.
  3. The planning and organising of teaching strategies for Mathematics will be reviewed on an **annual** basis by the **Mathematics subject leader and curriculum team** to ensure that no pupil is at a disadvantage.
  4. The school aims to maximise the use and benefits of Mathematics as one of many resources to enable all pupils to achieve their full potential.

# Monitoring and review

* 1. This policy will be reviewed on an **annual** basis by the **Mathematics subject leader and curriculum team** and **head teacher**.
  2. Any changes made to this policy will be communicated to all members of staff and the governing board.
  3. All members of staff directly involved with teaching Mathematics are required to familiarise themselves with this policy.