

St. John's C.E. Academy

Mathematics Policy

September 2020

Rationale

This policy outlines the teaching, organisation and management of the mathematics taught and learnt at St. John's C.E. Academy and its importance as an essential life-skill. It is the responsibility of all staff to ensure that the maths curriculum is delivered in accordance with our Christian values and ensures that all children reach their full potential and flourish as children of God.

The Nature of Mathematics

Mathematics is a tool for everyday life. It is a whole network of concepts and relationships that provide a way of viewing and making sense of the world. It is used to analyse and communicate information and ideas and to tackle a range of practical tasks and real-life problems. It also provides the materials and means for creating new imaginative worlds to explore.

Using the Programmes of Study from the National Curriculum, it is our aim to develop:

- A positive attitude and an awareness of the fascination of mathematics.
- Competence and confidence in mathematical knowledge, concepts and skills.
- An ability to carry out calculations efficiently, both mentally and through written methods.
- An ability to solve problems, to reason, to think logically and to work systematically and accurately.
- The initiative and an ability to work both independently and in cooperation with others.
- An ability to communicate mathematics.
- An ability to use and apply mathematics across the curriculum and in real life.
- An understanding of mathematics through a process of enquiry and experiment.

School Policy and the National Curriculum

Knowledge Skills and Understanding

At KS1 and KS2 teachers use the National Curriculum, supported by the National Centre for Excellence in Teaching Mathematics (www.ncetm.org.uk) and The White Rose Maths Hub to ensure that all parts of the National Curriculum Programmes of Study are taught. Each teacher submits a termly overview of the programmes of study to the mathematics coordinator, outlining the intended sequence of learning and to ensure a logical sequence of coverage.

Breadth of Study

Through careful planning and preparation, we aim to ensure that throughout the school, children are given opportunities for:

- Practical activities using manipulatives and pictorial representations.

- Mathematical games.
- Reasoning and problem solving.
- Varied fluency.
- Individual, group and whole class discussions and activities.
- A range of open and closed tasks.
- A range of methods of calculating e.g. mental, informal, bar modelling, formal.
- Practising and consolidating the skills of using and applying.
- Working with computers as a mathematical tool.
- Activities which are short in duration and those which can be developed over a longer period.
- Developing personal qualities and a positive attitude to mathematics.

Scheme of Work

Our school scheme of work is developed from the National Curriculum, supported by the National Centre for Excellence in Teaching Mathematics and The White Rose Maths Hub. It takes into consideration the needs of our children through ongoing formative and summative assessments.

Teacher's Planning and Organisation

Each class teacher is responsible for the mathematics in their class, supported by their Teaching Assistant, in consultation with and with guidance from the mathematics coordinator. The approach to the teaching of mathematics within the school is based on five key principles:

- **A mathematics lesson every day.**
- **An emphasis on rehearsing, sharpening and developing mental calculation.**
- **A clear focus on direct, instructional teaching and interactive oral work with the whole class, groups, pairs or individual work.**
- **Opportunities are given to develop varied fluency, reasoning and problem solving.**
- **An opportunity to assess learning through teacher, self and peer assessments.**

Each class is involved in a daily lesson of between 45 (KS1) and 60 (KS2) minutes for mathematics. Lessons are planned to be as interactive as possible in order to engage, stimulate interest and secure mathematical understanding. The use of individual whiteboards, number fans and talking partners are examples of such interactive devices.

Teachers of the Reception class base their teaching on objectives in the Early Years Framework. This ensures that they are working towards the updated 'Early Learning Goals for Mathematical Development'. Towards the end of Reception, teachers aim to draw the elements of a daily mathematics lesson together to ensure transition into Key Stage 1 is smooth and seamless.

Problem Solving

The National Curriculum states:

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.

At St John's we want children to become natural problem solvers and passionate mathematicians. Once children are familiar with a concept, teachers move the children on to applying those skills in a range of situations. This can take numerous forms such as real-life problems, investigations, seeking solutions and exploring patterns. Teachers are encouraged to extend the application of mathematics to real life projects such as financial education and coding.

Differentiation

Each new unit of work is taught to all children using a variety of concrete and pictorial representations. At St. John's, we have high expectations and children adopt a 'can do' attitude. After wave 1, children who need extra support receive it in a variety of ways. These include:

- **Pace:** The speed at which children progress onto more advanced work depends on how quickly they demonstrate their understanding.
- **Open Ended tasks:** Investigative tasks that are open ended and differentiation is by outcome.
- **Resourcing:** More proficient children move onto abstract written methods sooner. Less proficient children are given more time with concrete and pictorial methods to embed key concepts.
- **Support:** Either the class teacher or designated support staff provide extra support to children to enable them to understand.
- **Assessment for Learning:** Teachers are constantly assessing to challenge the higher attaining pupils and support the lower attaining pupils.

Special Educational Needs

Teachers aim to include all pupils fully within the daily mathematics lesson and their involvement is encouraged throughout. We strive to remove barriers to learning and to facilitate success through differentiated activities; a variety of teaching and learning styles (VAK); resources and support. Where applicable, children's One Plans incorporate suitable objectives from the National Curriculum and teachers keep these objectives in mind when planning work. When additional support staff are available to support groups or individual children, they work collaboratively with the class teacher to deliver relevant teaching.

Speaking and listening is as important in maths as in any other subject and the school recognises that maths lessons need to support this. Therefore, questions are structured in a variety of ways; vocabulary is explained; subject matter is visual whenever possible and thinking time is given.

Within the daily mathematics lesson teachers not only provide activities to support children who find mathematics difficult but also activities that provide appropriate challenges for children who are working above age-related expectations. The White Rose Maths planning, provides a variety of challenges, which allow more able children to broaden their understanding.

Mathletics provides a structured, ICT based, personalised learning programme with in-built assessment. This is accessed by children in each class from Years 1 - 6. The outcomes of the programme are monitored by the class teacher and reported to the Maths Coordinator on a weekly basis.

Equal Opportunities

There is a commitment to high achievement in mathematics regardless of gender, race, class or disability. The school monitoring cycle ensures that all children are given a high-quality mathematics education and support is provided where necessary. Where specific groups are identified as achieving less well, support plans are put in place to ensure these children receive opportunities to catch up.

Cross-Curricular

Throughout the whole curriculum, opportunities exist to extend and promote mathematics in a range of contexts. Teachers seek to take advantage of all opportunities in order that pupils can develop and apply their mathematical skills. We incorporate mathematics into a wide range of cross-curricular subjects and seek to take advantage of multi-cultural aspects of mathematics.

ICT

ICT is used in a variety of ways to support teaching and to motivate children's learning. It involves IWBs, tablets, computers, robots and audio-visual aids. These are used when it is the most efficient and effective way of meeting learning objectives. At St. John's we use interactive mathematical software, which provides a personalised learning experience based on a child's individual needs (see section on home learning). This is monitored by class teachers and the Mathematics Coordinator.

Recorded Work

Children are encouraged to use the most efficient method for finding an answer and this can mean that it is achieved mentally, with no need to show a working out but instead, orally explain their method. Children are taught a variety of methods for recording their work beginning with pictorial representations before moving onto the abstract, formal methods.

Exercise Books for Recording

It is school policy that the following pattern is used:

- Foundation: Plain exercise books for recording when appropriate
- KS1: 2 cm squares
- Year 3: 1 cm squares
- Year 4: 1 cm squares – gradually move to 7 mm squares when individual children are ready
- Year 5: 7 mm squares
- Year 6: 7 mm squares

A strong emphasis is placed on presentation when recording their work. When using squares, one square should be used for each digit and one for an operation or other symbol. When working with decimals, the decimal point should occupy a square of its own to emphasise its importance as a placeholder. When involved in routine practice of calculations, the children are encouraged to fold a page in half creating two columns for answers. During some problem-solving activities, blank paper is provided to encourage children to draw, jot and cross out in order to achieve the solution and not restrict them by insisting on a format for reaching an answer.

Marking

Children can produce a large quantity of work in a single maths lesson. It is widely recognised that the best form of feedback is instant marking, which allows the children to take ownership of their own learning. Therefore, work is marked throughout the lesson by the teacher and other adults in the class. This allows for intervention to be instant and relevant to the child. The children mark exercises that involve routine practice with support and guidance from the teacher, providing them with instant feedback and allowing the teacher and children know who will need extra support the next day.

All work is collected at the end of each session to enable teachers to make assessments that will inform future teaching and learning. Work may have a written comment made by the teacher/teaching assistant and these may address such issues as: presentation and number formation; attitude and approach to the task; praise and guidance as to how to make further progress. All children are given the opportunity to correct errors or complete extension tasks in green pen at the start of every session.

The quality of marking is crucial. A simple 'X' is of little assistance to a child unless accompanied by an indication of where the error has occurred, together with an explanation of what went wrong – this is ideally done orally where possible but may be explained in a written sentence in Key Stage 2.

Marking should be both diagnostic and summative and although we believe that this is best done through conversation with the child, we acknowledge that constraints of time do not always allow this (for more detail see the School Marking Policy).

Assessment and Record Keeping

Diagnostic assessment takes place at the beginning of each new unit of study to review learning and inform teaching. Assessment also takes place during and at the end of sessions and this informs future teaching and learning. Summative assessment takes place at the end of each term and this will be used to set targets for future learning.

Teachers are expected to make regular assessment of each child's progress and to record these systematically. The following is the school policy for assessment in mathematics:

Mental Maths Target Charts

Each class has a chart displaying the mental maths objectives for that year group. At the start of each maths session, the children carry out a 10min quickfire session assessing their understanding of one of the targets. Once a child has demonstrated secure understanding, the child can be ticked off.

Weekly Arithmetic

From Years 3 – 6, each class carries out a weekly arithmetic programme known as Test Base. These arithmetic papers are based on the Key Stage 2 arithmetic paper and are year group specific. The teacher records the child's baseline at the start of the Autumn term and monitors the child's weekly score as the year progresses. Each week, misconceptions are addressed and reinforced on the questions that the children should know but have not answered correctly.

Summative Assessment

At the end of each term, each child sits a PUMA assessment (Progression and Understanding in Mathematics Assessment). The PUMA is designed to assess children on all strands of maths and provide teachers with a standardised score. From this, teachers carry out a question level analysis in order to diagnose areas for development and set curricular targets for the future. The data can also be used to inform teachers and SLT of the achievement of individuals and groups of children, informing them of progress against the School Improvement Plan and children that require interventions.

ICT Based Assessment

Each child has access to Mathletics and Times Tables Rock Stars (Y2-6) and Numbots (Reception and Year 1). These interactive programs are primarily a learning tool but also serve as an assessment tool for teachers. Teachers are able to analyse the data from the work the children have submitted and set targets/intervene as necessary.

Reporting to Parents

Written reports are completed before the end of the summer term and Parent Consultation Meetings are held in the Autumn and Spring terms. At these meetings, parents are given the opportunity to discuss their child's progress and subsequent targets. Teachers use the information gathered from their half termly assessments to help them comment on individual children's progress.

Parental Involvement

- Parents are invited into school annually to observe maths being taught. This serves as support for parents in assisting with their child's learning at home.
- Parents are invited to assemblies to celebrate children's achievement in mathematics e.g. timetables number facts, Mathletics.
- Parents are sent a termly newsletter by the class teacher, which outlines the maths that the children will be covering and how they can help.
- Examples of children's work in all year groups is available to view on the school website, along with an explanation of what the children did. This serves to celebrate success and help parents to support their children.

Home Learning

It is our school policy to provide parents and carers with opportunities to work with their children at home. Parents are informed about expectations regarding homework through termly curriculum newsletters. All children have access Mathletics (Years 1-6); Times Tables Rock Stars (Y2 – 6); Numbots (Reception and Y1). These are personalised maths programs that allow children to learn in a fun and interactive way. Teachers set tasks based on the learning that is currently taking place in class at a level that the children can access independently at home. The expectation is that each week:

- Children in Years 1 – 6 will **pass** a minimum of three Mathletics tasks. This is that they score 90% or higher on the assessment. Should their score be lower than this, they should try again.
- Children in Years 5 and 6 will achieve 300 correct answers on Times Tables Rock Stars. These can be a mixture of all the times tables to 12 x 12; a select times table that the child is weak on or a more complex times table for children who are already confident and efficient to 12 x 12, such as 14 x tables 70 x tables.
- Children in Years 3 and 4 will achieve 200 correct answers per week on Times Tables Rock Stars. These should focus only on the times tables set out in the National Curriculum for that particular year group. Where children are confident and efficient, they should continue to increase their times and achieve higher scores.
- Children in Year 2 will achieve 100 correct answers per week on Times Tables Rock Stars. These should focus entirely on the times tables set out in the National Curriculum for that particular year group. Where children are confident and efficient, they should continue to increase their times and achieve higher scores.
- Children in Reception and Year 1 should complete one level on Numbots per week.

St. John's is an inclusive school and where children have limited internet access at home, the Computing Suite is available during breakfast club, lunchtimes and during some afterschool clubs for the children to complete homework.

Staffing and Resources

All teachers should organise an area within the classroom dedicated to mathematics resources. This area is easily accessible to all children and allows them to become familiar with all resources. There is a checklist of resources that each class should hold for day-to-day activities.

Resources which are not used or required regularly are stored centrally outside the Year 5 classroom in clearly labelled sections. New resources are brought to the attention of staff either informally or in a staff meeting. Maths working walls within the classroom should be relevant, current and support what the children are learning at any given time.

Monitoring and Evaluation

The mathematics coordinator is released regularly from his/her classroom in order to monitor and evaluate the quality and standard of mathematics throughout the school through monitoring planning, undertaking work scrutinies and observing lessons. (see Monitoring and Evaluation programme). The co-ordinator has an action plan for mathematics, which has been agreed with the school management team.

The Governing Body

The school has a mathematics link governor who visits the school to talk with the maths co-ordinator to discuss subject developments and points for action.

The Governing Body meets annually to scrutinise data, report on and monitor progress/attainment, evaluate performance and consider areas for development.

This policy will be reviewed in September 2021

Marco Ramsay

Mathematics Coordinator

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