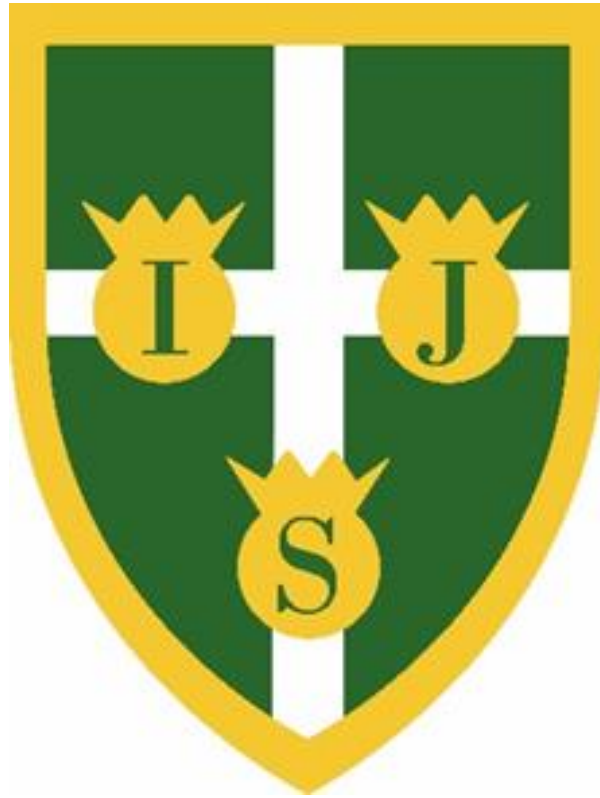


Ingrave Johnstone Church of England Primary School



Mathematics Policy

Approved by Governors: Spring 2022

Review Date: Spring 2025

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Mathematics Policy

Rationale

Mathematics equips pupils with the uniquely powerful set of tools to understand and change the world. These tools include logical reasoning, problem solving skills and the ability to think in abstract ways. Mathematics is important in everyday life.

It is integral to all aspects of life and with this in mind we endeavour to ensure that children develop a positive and enthusiastic attitude towards mathematics that will stay with them. The National Curriculum for mathematics (2014) describes in detail what pupils must learn in each year group. Combined with our Calculation Policy, this ensures continuity, progression and high expectations for attainment in mathematics.

It is vital that a positive attitude towards mathematics is encouraged amongst all of our pupils in order to foster confidence and achievement in a skill that is essential in our society. At Ingrave Johnstone, we use the National Curriculum for Mathematics (2014) as the basis of our mathematics programme. We are committed to ensuring that all pupils achieve mastery in the key concepts of mathematics, appropriate for their age group, in order that they make genuine progress and avoid gaps in their understanding that provide barriers to learning as they move through education. Assessment for Learning, an emphasis on investigation, problem solving, the development of mathematical thinking and development of teacher subject knowledge are therefore essential components of the Ingrave Johnstone's approach to this subject.

Aims

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.

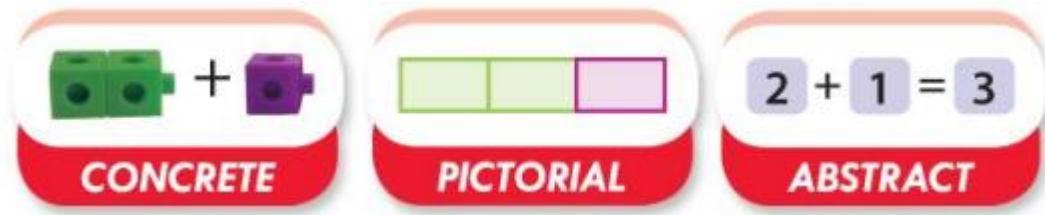
(New National Curriculum, July 2014)

In Early Years, the curriculum is guided by the Early Learning Goals and the 40-60 months Statutory Framework.

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The Mastery Approach

The teaching and learning of mathematics at Ingrave Johnstone Primary should include aspects of the following Mastery approach strategies in every lesson and/or over a series of lessons:



‘Concrete, pictorial, abstract (CPA) is a highly effective approach to teaching that develops a deep and sustainable understanding of maths.’

CONCRETE

Concrete is the “doing” stage, using concrete objects to model problems. Instead of the traditional method of mathematics teaching, where a teacher demonstrates how to solve a problem, the CPA approach brings concepts to life by allowing pupils to experience and handle physical objects themselves. Every new abstract concept is learned first with a “concrete” or physical experience. For example, if a problem is about adding up four baskets of fruit, the pupils might first handle actual fruit before progressing to handling counters or cubes which are used to represent the fruit.

PICTORIAL

Pictorial is the “seeing” stage, using representations of the objects to model problems. This stage encourages pupils to make a mental connection between the physical object and abstract levels of understanding by drawing or looking at pictures, circles, diagrams or models which represent the objects in the problem. Building or drawing a model makes it easier for pupils to grasp concepts they traditionally find more difficult, such as fractions, as it helps them visualise the problem and make it more accessible.

ABSTRACT

Abstract is the “symbolic” stage, where pupils are able to use abstract symbols to model problems (Hauser). Only once a child has demonstrated that they have a solid understanding of the “concrete” and “pictorial” representations of the problem, can the teacher introduce the more “abstract” concept, such as mathematical symbols. Pupils 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.

Planning

At Ingrave Johnstone, Teachers in Years 1 – 6 follow the White Rose Planning. This provides the yearly overview and Medium-Term planning for each year group. For calculation, our calculation policy, which follows our Mastery Approach, should be adhered to and displayed in the classroom and is made available to all parents.

The White Rose Maths Hub scheme exemplifies the maths objectives and these are broken down into fluency, reasoning and problem solving – the key aims of the National Curriculum. They support a mastery approach to teaching and learning and have number at their heart. They ensure teachers stay in the required key stage and support the ideal of depth before breadth. They support pupils working together as a whole group and provide plenty of time to build reasoning and problem-solving elements into the curriculum.

White Rose Maths planning

Medium term planning is handed to the headteacher at the beginning of each term. Short term planning is filed centrally each week retrospectively with evaluation of the work covered. Each teacher uses a standard planning grid for consistency across the school.

Early Years Foundation Stage (EYFS)

We follow EYFS curriculum guidance for Mathematics. However, we are committed to ensuring the confident development of number sense and put emphasis on mastery of key early concepts. Pupils explore the 'story' of numbers to twenty and the development of models and images for numbers as a solid foundation for further progress, for example by introducing Numicon as a key resource.

Medium-term assessment in the Foundation Stage:

Throughout the year Early Years, teachers will gather good evidence to file in the children's Learning Journey and online with Tapestry. This information will then be used to make the decision whether children are working below, working at or working above age related expectations in number and shape, space and measure, with reference to Development Matters. This information will be updated termly into the Early Years Target Tracker.

Times Tables

Times Tables are a mathematics 'Non-negotiable' and must be taught and then practised. TT RockStars is available for the practice of times tables. We teach times tables using the following progression:

- Year 1 – Be able to count in multiples of twos, fives and tens
- Year 2 - Be able to recall 2, 5 and 10 multiplication and division facts
- Year 3 - Be able to recall 3, 4 and 8 multiplication and division facts
- Year 4 - Be able to recall 6, 7 and 9 multiplication and division facts
- Year 5/6 - application of multiplication and division facts to problem solving

NB: All times tables to be learnt up to 12 x 12

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From 2019/2020 Year 4 pupils will take an online Times Table Check test which will be a timed assessment testing their speed of recall for multiplication and division facts.

Presentation and marking of work

Further details can be found in the Marking Policy.

Homework

Children in Years 1-6 are set mathematics homework. Details of the expectations in terms of time allocation can be found in the homework policy document.

Assessment

Assessment is an integral and continuous part of our teaching and learning process 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 success criteria, effective feedback and response in their teaching and marking and observing children participating in activities. Teachers use *Assessment for Learning* tasks to identify children's starting points at the start of units/lessons, where appropriate, in order to plan and provide appropriate challenge for each group for learners. Findings from all of these types of assessment are used to initiate immediate intervention and inform future planning.

Alongside our formative assessment, we also can use more formal methods to determine the levels of achievement of children at various times during the school year. We use termly assessments as a way of recording children's progress in objectives covered across that specific term. We refer to examples of standardised tests to review the overall understanding and standards of children's mathematical ability at various points throughout the journey in our school.

Target Tracker is used to record children's attainment in mathematics and records are updated on a termly basis. Topic tests can be used at the end of each topic to assess progress against age related expectations. Progress towards the age-related expectations are recorded on Target Tracker and discussed termly at Pupil Progress Meetings with the Class teacher, Headteacher and Deputy Headteacher/Maths Subject Leader.

Long-term assessment will take place towards the end of the school year to assess and review pupils' progress and attainment. These will be made through the compulsory National Curriculum mathematics tests for pupils in year 2 and 6 and supplemented by White Rose End of Year tests for those in years 1, 3, 4 and 5. Teachers will also draw upon their class record of attainment and supplementary notes and knowledge about their class to produce a summative record. Accurate information will then be reported to the child's parents and next teacher.

Reporting

Reporting to parents will adhere to the following guidelines:

- Set out what the children have been taught and what they have learned
- Be written with the reader in mind
- Summarise the pupil's performance since the last report

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- Highlight positive achievement and progress made
- Identify weaknesses and suggest positive future action
- Be written with an eye to motivating the child for the coming year

Inclusion

Pupils with SEN and/or learning difficulties or disabilities

Where possible through the use of appropriate access strategies and support, children with SEN will be working towards the same learning objectives as their peers. From time to time those working well below the level of the whole class may be working towards related objectives chosen from an earlier year. Where identified, some children have the opportunity to participate in 1-1 and small groups where they receive targeted support relevant to their needs.

Pupils who are gifted and talented

Children who are working well above the overall level of their class or group will be engaging with a range of experiences designed to master and secure their learning while working on the same learning objectives as their peers.

Pupils learning EAL

Children learning EAL will be accessing curriculum content while also developing cognitive and academic language within whole-class, group and independent contexts. Through the use of appropriate access strategies and support, they will be experiencing a level of cognitive challenge consistent with that provided by their peers. Those children who have become conversationally fluent will continue to receive support to develop the academic language and vocabulary associated with the subject and the language and grammar used to express ideas and thinking within the subject.

Mastery

Curriculum design

A detailed, structured curriculum is mapped out across all phases, ensuring continuity and supporting transition. Effective mastery curricula in mathematics are designed in relatively small carefully sequenced steps, which must each be mastered before pupils move to the next stage. Fundamental skills and knowledge are secured first. This often entails focusing on curriculum content in considerable depth at early stages.

Teaching resources

A coherent programme of high-quality curriculum materials is used to support classroom teaching. Concrete and pictorial representations of mathematics are chosen carefully to help build procedural and conceptual knowledge together. Exercises are structured with great care to build deep conceptual knowledge alongside developing procedural fluency. The focus is on the development of deep structural knowledge and the ability to make connections. Making connections in mathematics deepens knowledge of concepts and procedures, ensures what is learnt is sustained over time, and cuts down the time required to assimilate and master later concepts and techniques.

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Lesson design

Lessons are crafted with similar care and are often perfected over time with input from other teachers, drawing on evidence from observations of pupils in class. Lesson designs set out in detail well-tested methods to teach a given mathematical topic. They include a variety of representations needed to introduce and explore a concept effectively and also set out related teacher explanations and questions to pupils.

Teaching methods

Teachers are clear that their role is to teach in a precise way which makes it possible for all pupils to engage successfully with tasks at the expected level of challenge. Precise questioning during lessons ensures that pupils develop fluent technical proficiency and think deeply about the underpinning mathematical concepts.

Pupil support and differentiation

Taking a mastery approach, differentiation occurs in the support and intervention provided to different pupils, not in the topics taught, particularly at earlier stages. There is no differentiation in content taught, but the questioning and scaffolding individual pupils receive in class as they work through problems will differ, with higher attainers challenged through more demanding problems which deepen their knowledge of the same content. Pupils' difficulties and misconceptions are identified through immediate formative assessment and addressed with rapid intervention – commonly through individual or small group support later the same day: there are very few “closing the gap” strategies, because there are very few gaps to close. Productivity and practice Fluency comes from deep knowledge and practice. Pupils work hard and are productive. At early stages, explicit learning of multiplication tables is important in the journey towards fluency and contributes to quick and efficient mental calculation. Practice leads to other number facts becoming second nature. The ability to recall facts from long term memory and manipulate them to work out other facts is also important.