

St. George's Catholic Primary School

'Achieve, Believe, Care.'

Mathematics Policy

1. MISSION STATEMENT

At St George's Catholic Primary School, we welcome everyone as a member of God's family. With Jesus in our hearts, we pray together, we work together, we show respect for each other and the world around us.

We love God, ourselves and one another.

2. AIMS AND OBJECTIVES

Mathematics teaches children how to make sense of the world around them through developing their ability to calculate, reason and solve problems. It enables children to understand relationships and patterns in both number and space in their everyday lives. Through their growing knowledge and understanding, children learn to appreciate the contribution made by many cultures to the development and application of mathematics.

Our objectives in the teaching of mathematics are to:

- Promote enjoyment of learning through practical activity, exploration and discussion
- Promote confidence and competence with numbers and the number system
- Develop the ability to solve problems through decision-making and reasoning in a range of contexts
- Develop a practical understanding of the ways in which information is gathered and presented
- Explore features of shape and space, and develop measuring skills in a range of contexts
- Help children understand the importance of mathematics in everyday life
- Develop the cross-curricular use of mathematics in other subjects

3. TEACHING AND LEARNING STYLE

The school uses a variety of teaching and learning styles in mathematics. Our principal aim is to develop children's knowledge, skills and understanding. During our daily lessons, we encourage children to ask as well as answer mathematical questions. They have the opportunity to use a wide range of resources, such as number lines, number squares, digit cards, numicon and small apparatus to support their work. Mathematical dictionaries are available to use in all classrooms. ICT is used in mathematics lessons for modelling ideas and methods. Wherever possible, we encourage the children to apply their learning to everyday situations.

In all classes, children have a wide range of mathematical abilities. 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 through differentiated group work, and in other lessons by organising the children to work in pairs on open-

ended problems or games. We use classroom assistants to support or challenge some children, and to ensure that work is matched to the needs of individuals.

4. MATHEMATICS CURRICULUM PLANNING

Mathematics is a core subject in the National Curriculum, and we use the National Curriculum Framework for mathematics, supplemented with Whiterose Schemes of Learning, as the basis for implementing the statutory requirements of the programme of study for mathematics.

Our medium-term mathematics plans give details of the main teaching objectives for each term and define what we teach. They ensure an appropriate balance and distribution of work across each term.

It is the class teacher who completes the weekly plans for the teaching of mathematics. These weekly plans list the specific learning challenges and expected outcomes for each lesson, and give details of how the lessons are to be taught. The class teacher keeps these individual plans, and the class teacher and subject leader discuss them on an informal basis.

We plan the activities in mathematics so that they build on the children's prior learning. While we give children of all abilities the opportunity to develop their skills, knowledge and understanding, we also plan progression into the scheme of work, so that there is an increasing challenge for the children as they move up through the school.

5. CALCULATIONS

The progression of strategies and written methods for calculations which children will be taught as they develop in their understanding of the four operations is shown in the appendices A, B & C.

Strategies are set out in a Concrete, Pictorial, Abstract (CPA) approach to develop children's deep understanding and mastery of mathematical concepts. Children use concrete objects to help them make sense of the concept or problem; this could be anything from real or plastic fruit, to straws, counters or cubes. This is then developed through the use of images, models and children's own pictorial representations before moving on to the abstract mathematics. Children will travel along this continuum again and again, often revisiting previous stages when a concept is extended. It is also worth noting that if a child has moved on from the concrete to the pictorial, it does not mean that the concrete cannot be used alongside the pictorial. Or if a child is working in the abstract, 'proving' something or 'working out' could involve use of the concrete or pictorial.

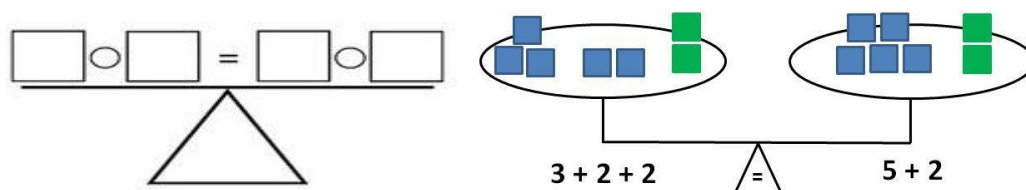
Similarly, although the strategies are taught in a progressive sequence, they are designed to equip children with a 'tool box' of skills and strategies that they can apply to solve problems in a range of contexts. So as a new strategy is taught it does not necessarily supersede the previous, but builds on prior learning to enable children to have a variety of tools to select from. As children become increasingly independent, they will be able to and must be encouraged to select those strategies which are most efficient for the task.

The strategies are separated into the 4 operations for ease of reference. However, it is intended that addition and subtraction, and multiplication and division will be taught together to ensure that children are making connections and seeing relationships in their mathematics. Therefore, some strategies will be taught simultaneously, for example, counting on (addition) and counting back (subtraction).

Children should be moved through the strategies at a pace appropriate to their age related expectations as defined in the EYFS and NC. Effective teaching of the strategies rely on increasing levels of number sense, fluency and ability to reason mathematically. Children must be supported to gain depth of understanding within the strategy through the CPA approach and not learn strategies as a procedure.

Teaching equality

It is important that when teaching the 4 operations that equality (=) is also taught appropriately. Misconceptions that = means that children must 'do something' and that it indicates that an answer is needed are common and must be addressed early on. Teachers should present children with number sentences and problems which place the = sign in different positions, different context and include missing box problems. For example, $?+4=7$; $7=3+?$; $<$, $>$, or $=$ $5+6$ $7+4$. In the concrete phase, scales and Numicon provide a useful resource to demonstrate equality. Pictorial representations of equality can be used as shown below:



Importance of vocabulary

The 2014 National Curriculum places great emphasis on the importance of pupils using the correct mathematical language as a central part of their learning. Children will be unable to articulate their mathematical reasoning if they lack the mathematical vocabulary required to do so. It is therefore essential that teaching using the strategies outlined in this policy is accompanied by the use of appropriate mathematical vocabulary. New vocabulary should be introduced in a suitable context (for example, with relevant real objects, apparatus, pictures or diagrams) and explained carefully. High expectations of the mathematical language used are essential, with teachers modelling and only accepting what is correct. For example:

✓	✗
ones	units
is equal to	equals
zero	oh (the letter O)
number sentence	sum/s

6. THE EARLY YEARS FOUNDATION STAGE (EYFS)

We teach mathematics in our Reception class. As the class is part of the EYFS, we relate the mathematical aspects of the children's work to the objectives set out within the Early Years Profile. We give all the children ample opportunity, within the appropriate age development bands, to develop their understanding of number, measurement, pattern, shape and space, through varied activities that allow them to enjoy, explore, practise and talk confidently about mathematics

7. LINKS BETWEEN MATHEMATICS AND OTHER SUBJECTS

Throughout the whole curriculum opportunities exist to extend and promote mathematics. Teachers seek to take advantage of all opportunities. Mathematics contributes to many subjects within the primary curriculum and opportunities will be sought to draw mathematical experience out of a wide range of activities. This will allow children to begin to use and apply mathematics in real contexts. Examples of subject links are below:

English

The teaching of mathematics contributes significantly to children's understanding of English in our school by actively promoting the skills of reading, comprehension, writing, speaking and listening. For example, in mathematics lessons, we expect children to read and interpret problems, in order to identify the mathematics involved. They are also improving their command of English when they explain and present their work to others during plenary sessions. In English lessons, too, maths can contribute: younger children enjoy stories and rhyme that rely on counting and sequencing, while older children encounter mathematical vocabulary, graphs and charts when reading non-fiction texts.

Science

Children collect, read and interpret data in scientific investigations using their mathematical skills. Reading scales, timers and measurements take place and results are recorded.

Geography

Children read grid co-ordinates and compass points when completing map work. Fieldwork and class surveys are carried out and data analysed to present findings.

Art

Children use mathematical skills in art and are given the opportunity to explore pattern, symmetry, identify shapes and proportion and use spatial awareness when drawing/painting.

8. MATHEMATICS AND ICT

Information and communication technology enhances the teaching of mathematics significantly, because ICT is particularly useful for mathematical tasks. It offers ways of impacting on learning which are not possible with conventional methods. Children use a variety of maths programs such as Hit The Button and Mymaths (and Doodlemaths in year 6) to support and enhance their learning. Teachers can use software to present information visually, dynamically and interactively, so that children understand concepts more quickly. Younger children use ICT to communicate results with appropriate mathematical symbols. Older children use it to produce graphs and tables when explaining their results, or when creating repeating patterns, such as tessellations.

9. MATHEMATICS AND INCLUSION

At our school, we teach mathematics to all children, whatever their ability and individual needs. Mathematics forms part of the school curriculum policy to provide a broad and

balanced education to all children. Through our mathematics teaching, we provide learning opportunities that enable all pupils to make good progress. We strive hard to meet the needs of those pupils with specific educational needs, those with disabilities, those with special gifts and talents and those learning English as an additional language, and we take all reasonable steps to achieve this. Intervention groups take place and teaching assistants have been trained to deliver specific interventions such as Shine maths.

When progress falls significantly outside the expected range, the child may have specific educational needs. Our assessment process looks at a range of factors – classroom organisation, teaching materials, teaching style and differentiation – so that we can take some additional or different action to enable the child to learn more effectively. Assessment against the National Curriculum allows us to consider each child's attainment and progress against expected levels. This ensures that our teaching is matched to the child's needs.

Intervention programs are provided for children with specific educational needs. Step 7's may include, as appropriate, specific targets relating to mathematics. As well as targeted intervention groups and classroom support, tactile and visual resources are purchased to enhance teaching and learning.

We enable all pupils to have access to the full range of activities involved in learning mathematics.

10. ASSESSMENT FOR LEARNING

Teacher's assessment of children's work and progress is ongoing. Throughout the term children complete pre, mid and end of topic progress assessments which are used alongside Assessing Pupil Progress on a daily basis to inform progress and planning. Weekly skills and mental arithmetic tests take place and KIRFS (Key Instant Recall Facts) are embedded throughout the school.

Pupil Progress is monitored and recorded each half term on the Pupil Tracker. Judgements are based on end of topic, end of term and end of year assessment tests as well as ongoing teacher reviews.

Older children are encouraged to make judgements about how they can improve their own and each other's work.

11. RESOURCES

All classrooms have a wide range of appropriate small apparatus and visual aids. A range of software, including the Mymaths interactive teaching and learning program, is available to support work on computers and iPads. Year 6 for example, use 'Doodlemaths' as a personalised interactive learning platform and from Year 2 upwards, 'Times Tables Rockstars' supports the learning of Times Tables. Numicon is used as a resource-based learning tool and the associated materials, along with Whiterose Learning Schemes and Target Your Maths, help to support teaching and learning throughout the school.

12. MONITORING AND REVIEW

The co-ordinator supports colleagues in their teaching, by keeping them informed about current developments in mathematics, and by providing a strategic lead and direction for

this subject. She also uses specially allocated time to review evidence of the children's work, and to observe mathematics lessons across the school.

The quality of teaching and learning in mathematics is monitored and evaluated by the Senior Leadership Team (SLT) and co-ordinator as part of the school's agreed cycle of lesson observations.

This policy will be reviewed at least every three years.