



CANTRELL PRIMARY AND NURSERY SCHOOL

Mathematics Policy

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National Curriculum

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.”

Curriculum Intent

At Cantrell Primary School the intent is for our maths teaching to enable each child to develop their learning and achieve their full potential. We endeavour to not only develop the mathematics skills and understanding required for later life, but also to foster an enthusiasm and fascination about maths itself. We aim to increase pupil confidence and ambition in maths, so they are able to express themselves and their ideas using the language of maths with assurance. We aim to inspire and excite students by making learning exciting, personalising our interactions with pupils through feedback and expectations, promoting independent study and encouraging risk taking by rewarding the process not just the outcome.

Our aim is to ensure that all children:

- Become fluent in the fundamentals of mathematics, including varied and frequent practice using increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- Are able to reason and explain 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 skill and confidence, including breaking down problems, persevering in tasks and being able to consider a variety of approaches.

At Cantrell, we value and encourage, across all classrooms, talk opportunities, a concrete, pictorial, abstract path to learning which supports pupils to work towards having the resilience and skills required to be real life problem solvers and to be fluent in both their number skills and ability to express their understanding.

Solving multi-step problems at Cantrell is a stumbling block for a lot of our children as they progress through school. At Cantrell, we intend on teaching multi-step problems from Year 2 onwards. The numbers used are not big. Our children need to understand that problems do not always have just one step - that sometimes we need to do 2, 3 or 4 calculations to get to the answer. By solving multi-step problems, we can build up the children’s maths stamina.

By following the LA Number Fluency Project, we intend the children at Cantrell to be able to use number facts and then mental calculation strategies so that when they leave Year 6 they are not using their fingers to solve simple number facts.

Implementation

- For maths, our long term planning follows the National Curriculum. Medium and short term planning is supported by the use of the White Rose Maths Hub materials and our school calculation policy.
- By using a variety of planning resources we believe that we provide a bespoke teaching and learning experience that is designed to interest, inform and inspire our children.
- Using prior knowledge as a starting point for all future planning (Yellow AFL sheets) and teaching, we plan lessons which are required for all pupils to make good progress.
- Lessons are started with an Anchor Task. An anchor task is based upon a one or two step problem which, where possible, applies different areas of the maths curriculum that enables opportunities for the children to discuss and share different ways to solve the problem. This discussion allows the teacher to assess knowledge and understanding, intervene in any gaps, question for deeper understanding, model and reinforce correct mathematical vocabulary and extend learning as needed.
- To secure knowledge, strategies and confidence we are implementing a fact box under the Anchor Task, where appropriate. (September 2021) Once the Anchor Task has been discussed with the children, initially with support, a fact box will be recorded that has the information the children will need to know and apply in order to start to solve the problem. Over time, and depending on year group, the aim will be for the children to produce their own fact boxes as a way of becoming more independent and improving accuracy.
- The next part of the lesson is the Guided Session. Here new learning is introduced, modelled, scaffolded and discussed.
- Maths lessons are designed with a concrete, pictorial and abstract (CPA) approach, providing our pupils with the scaffolding required to access the learning at all levels.

- Independent tasks will be carefully planned to support fluency and problem solving. Allowing all children, the opportunity to work at their own speed and understanding.
- For those children who need extending, challenges are provided. These will be through further problem solving, multi-step problems and investigations. Tasks are also set on Mathletics, My Maths (Year 6), Corbett Maths (Year 5 and 6), Purple Mash and TTRS.
- For those children working well below their peers, where possible, they will have a bespoke curriculum aimed to build up their arithmetic knowledge, confidence and apply strategies that is appropriate to their level of learning.
- Problem solving strategies will be taught alongside anchor tasks where appropriate or as a separate lesson if children need to acquire a new strategy. Problem solving strategies we implement at Cantrell are: number lines, bar models, working backwards, pictures/images, spotting patterns and relationships and working systematically.
- Morning Maths – twice a week – a worksheet to recap previous learning, reinforce key facts and consolidate key strategies from the previous year. These could be linked to areas such as shape, measurement facts, times tables and number bonds. Sheets can be found for example on Twinkl, CPG books, Flashback 4, or made by the teacher.
- Number Fluency – KS1 and Year 3: once a week with the trays to introduce the fluency fact/strategy and then twice during the week. Year 4-6: an extra arithmetic lesson outside of the maths lesson focusing on the different mental calculation strategies that can increase fluency and accuracy. (Number facts, relationships, doubles, near doubles, place value, partitioning, adjusting)
- Through research, girls at Cantrell lack confidence linked to solving problems as they need longer to process the steps required and feel that the boys can answer quicker. Therefore, where possible, at Cantrell we sit girls next to each other to allow them to talk more confidently.
- Homework is set to reinforce and consolidate the week's learning. This can be set as online or worksheets depending on the teacher and year group.
- Displays – age-appropriate posters linked to measures, number bonds, times tables and shape are displayed in the classrooms, and referred to, and the children are encouraged to use them. Research has shown that eventually children will stop looking at facts once they have remembered them. These posters will also support the fact boxes for the Anchor Tasks. Each class will have a working wall, which will reflect previous lessons learning, key vocab and adaptations to support retrieval and reinforce progression through a unit.
- Resources- each class has equipment in their rooms which they use as and when needed. There is also a cupboard near the ICT suite with further larger pieces of equipment and other maths resources should a teacher need something different.

Foundation Stage

In both Reception and Nursey mathematics is taught daily through interactive first-hand experiences. This includes counting, matching, subitising (recognising an amount without counting) patterning and problem solving. We follow a 'Mastery' approach to teaching and learning within a smaller group. Children are encouraged to verbalise their understanding and acquire mathematical language and vocabulary. We aim to develop positive attitudes and interest in mathematics to apply in the real world. The learning environment and resources allow all children to apply their skills through play and investigation.

Contribution of mathematics to teaching in other curriculum areas:

English

Mathematics contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. For example, we encourage children to read and interpret problems in order to identify the mathematics involved. The children explain and present their work to others during different parts of the sessions. Younger children enjoy stories and rhymes that rely on counting and sequencing, this includes rhymes in different languages and from a variety of cultures. Older children encounter mathematical vocabulary and the need to explain and justify graphs and charts when using non-fiction texts.

Information and communication technology (ICT)

Children use and apply mathematics in a variety of ways when solving problems using ICT. 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. Key Stage 1 and 2 use Mathletics and Times Tables Rock Stars to enhance and develop mental maths skills and revise work on different areas both at school and home.

Personal, social and health education (PSHE) and citizenship

Mathematics contributes to the teaching of personal, social and health education, and citizenship. The work that children do outside their normal lessons encourages independent study and helps them to become increasingly

responsible for their own learning. The planned activities that children do within the classroom encourage them to work together and respect each other's views. We present children with real-life situations in their work wherever possible.

Spiritual, moral, social and cultural development.

The teaching of mathematics supports the social development of our children through the way we expect them to work with each other in lessons. We group children so that they work together, and we give them the chance to discuss their ideas and results.

Science

Children use maths skills across the science curriculum including: generalising and hypothesising, problem solving, collecting and presenting data.

Teaching mathematics to children with special educational needs (including able mathematicians)

At Cantrell we teach mathematics to all children, whatever their ability. 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 progress. We do this by setting suitable learning challenges and responding to each child's different needs. Assessment against the National Curriculum allows us to consider each child's attainment and progress against expected levels. Dynamo Maths is used as an intervention programme to support where needed. Teachers and TA's work together to adapt the lessons and resources needed so that where possible all the children in the lesson, will be able to access the new learning.

Impact

(How planning, teaching and assessments have impact on progress and learning)

Marking is completed where possible with the children in the lesson which allows time at the end of the lesson to follow up on any misconceptions, extend learning and adapt the next lesson if needed.

- Teaching develops and embeds knowledge and skills in maths that show a change in long term memory – and that can be applied in different contexts and time periods. As a result, pupils achieve well as reflected in national tests.
- At the beginning of a unit the children complete a Yellow AFL sheet from the previous year group. The results then inform planning and teaching. At the end of the unit children complete the AFL sheet from their own year group. Where there are gaps in the children's learning, these will inform lesson starters and be targeted for interventions.
- All children will take part in a termly assessment which is used to track progress across the year and to identify gaps in learning. These are followed up by pupil progress meetings where further interventions, changes to groups, meeting with parents and any other relevant information about the children can be shared with Senior Management and necessary provision put in place.
- The maths leader has a clear role and overall responsibility for the progress of all children in maths throughout school. Working with SLT, key data is analysed and regular feedback is provided and discussed at pupil progress meetings to inform progress and future actions.
- The maths lead attends termly network meetings with the LA Maths Lead, Jane Gill. If any areas are identified in pupil progress meetings or if staff training is needed, Jane is available to come and support in school. Cantrell is now part of the Maths hub and the Maths Lead and another member of staff have termly meetings with Phil Herd.
- Year 2-5 complete weekly times tables tests to monitor progress. Year 6 complete weekly arithmetic tests from the spring term. These results inform teaching for the following week and interventions and/or booster groups.

Outcomes

At Cantrell Primary School the outcomes in mathematics have been rising and the last few years show around 80% of children achieving the expected standard by the end of KS2.