



Brookfield Junior Academy Maths

Intent

At Brookfield Junior Academy, we aim to inspire all children to reach their true potential. In Mathematics this means ensuring a curriculum that is fully inclusive of all children:

- Develops children's knowledge and understanding of mathematical concepts whilst enabling them to practise and hone skills and methods;
- Enables them to think critically and communicate their understanding;
- Provides them with opportunities to apply learnt mathematical skills in different contexts across the curriculum.
- Provides opportunities to develop problem solving and reasoning skills useful for Mathematics and across the curriculum.

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As a result of their learning in Mathematics and problem solving across the curriculum, children will:

- Be prepared for applying their skills effectively in everyday life situations, in their future learning and in the work place.
- Retain mathematical knowledge and make links to other areas outside of Mathematics.
- Have the building blocks in place to provide a solid foundation to lead onto the next stage in their education.

Through teaching with a problem solving approach, children will learn to understand and clarify information; consider what they know that will help them to solve problems, realising what they need to know next; create systems and strategies, organising information in a way that helps find patterns and ultimately solutions and to communicate and present their findings effectively.

Implement

Our children will become fluent in the fundamentals of Mathematics, including through varied and frequent practise with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately

They will reason mathematically by following a line of enquiry, conjecturing relationships and generalisations and developing an argument, justification or proof using mathematical language.

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Children will solve problems by applying their Mathematics to a variety of routine and non-routine problems with increasing sophistication including breaking down the problems into a series of simpler steps and showing resilience in seeking solutions.

Impact

By the time our children leave Year 6, we expect them to be confident and competent with number/place value, addition and subtraction, multiplication and division, fractions (including decimals and percentages), measurement, geometry: properties of shape/position and direction and statistics.

By the end of each academic year, the majority of pupils should be at Expected or Greater Depth at their appropriate year (Expected level in Foundation Stage). This allows subsequent teachers to start their planning at the appropriate age-related stage. Any child who has not reached this target, will be identified by the class teacher and a member of Leadership Team at pupil progress meetings, and bespoke interventions will be identified to ensure that they make accelerated progress to catch up. By the end of Key Stage 2, the majority of pupils should reach Expected or Greater Depth age-related expectations.

Foundation Stage

In the Early Years Foundation Stage, the 'Mathematics' area of learning supports pupils in developing their 'number' and 'numerical pattern' skills. The EYFS curriculum and learning environment ensure pupils have access to focused, teacher-

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led Mathematics tasks as well as opportunities for child-initiated activities within continuous provision.

These include the following:

- Chanting numbers forwards and backwards
- Counting objects and matching the amount to the correct numeral
- Writing numbers using rhymes to support formation
- Practical addition and subtraction using concrete materials
- Learning and recalling facts such as number bonds
- Exploring 2D and 3D shapes and the related vocabulary
- Make comparisons between objects relating to size, length, weight and capacity
- Continuing, copying and creating patterns

Planning Maths

- Teachers plan with a thorough understanding of children's needs - which is achieved through effective and rigorous assessment and tracking, combined with high expectations and ambition for all children to achieve.

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- The long term plan for each year group is taken with guidance from the White Rose scheme of work and adapted for each academy on an individual basis. All teachers follow this.
- The majority of children will be working at the age-related level or above. Where children are working significantly below the age-related expectation, objectives from lower age groups will be used. For children deemed to be achieving at a higher level, the teachers will plan for them to cover the curriculum at a greater depth to further develop their level of understanding.
- Planning, where possible, will involve real life contexts for Mathematics, where children are problem solving with a purpose in mind.
- Apparatus/Pictorial representations should be used to enable children to master concepts. Staff plan for concrete experiences, pictorial and then abstract.
- There should be problem solving evident in learning (particularly if children are covering the curriculum at a greater depth): finding all possibilities, logic problems, finding rules and describing patterns, diagram/visual problems and exploring different aspects of number.
- Class teachers will regularly plan for opportunities for children to apply their Mathematical skills to different problems within Mathematics lessons and across the curriculum. This will also allow children to revisit, practise and consolidate different areas of maths and apply them within different contexts. Thus enabling this knowledge to 'stick' and be transferrable.
- Children's basic skills are of great importance, with number bonds, times tables facts and various strategies for calculation taught and practised at school - with support sought from parents/carers through homework activities, for example, TT Rockstars.
- Planning will take into account misconceptions seen in the lessons, marking of books, or assessments. Staff may look ahead to the next unit of maths and identify fluency facts/strategies that children may need in their learning.

- This teaching structure is followed: model the concept, children work independently on questions (differentiated when appropriate), learning is marked, address misconceptions.
- All learning is marked by the teacher, TA or marked collectively by the pupils. This takes place every day. Next steps or challenges are identified when appropriate. Consistent use of marking is used throughout academy. The symbols are displayed in the front cover of all books.
- Presentation is to be of a high standard. Expectations are highlighted in the front cover of every maths book and are modelled as required.
- The date for each lesson is recorded in the number format and is underlined. All titles are underlined.

Teaching Maths

- Mathematics learning builds from a concrete understanding of concepts where children are able to manipulate concrete apparatus, identify pictorial representations and answer abstract questions (this can be fluid in approach).
- Children should be encouraged to communicate their understanding of Mathematics so that it clarifies their thoughts.
- A progression towards efficient written calculations is developed and applied consistently in each year-group (see Calculation Policy).
- Lessons vary depending on the needs of the children. As a guide, children should be: active; practising skills they have not yet mastered (may include recapping on misconceptions); learning something new or learning to apply their knowledge to different contexts.
- They should be working at a good pace and being productive.
- When teaching problem solving skills across the curriculum, time should be given to each aspect of problem solving: preparing for problem solving, thinking through problems to establish what they know and do not know so far; problem

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solving effectively; and communicating the answer effectively. They should evaluate the process. Over time, children will improve at each aspect.

- In each class, there is a range of mathematical abilities. We provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child.

Assessments

- Assessment for learning should occur throughout the entire lesson, enabling teachers/teaching assistants to adapt their teaching/input to meet children's needs. This feedback should be incisive and regular.
- Children should self-assess against what they were learning - giving them a sense of success.
- Teachers use end of term tests, which inform their teacher assessments. Pupil progress meetings are used to identify children who are not making good progress over time in order that additional support can be discussed and identified. What that support will look like and how intensive, depends on the child's needs. This might be a simple strategy within whole class teaching; further support such as interventions; or pre teaching sessions to address misconceptions.

Maths Mastery

Mastering maths means pupils acquiring a deep, long-term, secure and adaptable understanding of the subject. The phrase 'teaching for mastery' describes the elements of classroom practice and academy organisation that combine to give pupils the best chances of mastering maths. Achieving mastery means acquiring a solid enough understanding of the Mathematics that has been taught to enable pupils to move on to more advanced material.

We value the principles behind the mastery approach to teaching Mathematics. Children enjoy a range of investigations, activities

and games, which consolidates their understanding and ensures they are best prepared for the next academic year. In this way, they are applying their understanding and skills in different (and often real life) contexts.

- Coherence - Connecting new ideas to concepts that have already been understood, and ensuring that, once understood and mastered, new ideas are used again in next steps of learning.
- Representation and Structure - Representations used in lessons expose the mathematical structure being taught, the aim being that students can do the Mathematics without the representation.
- Mathematical Thinking - If taught ideas are to be understood deeply, they must be worked on, thought about, reasoned with and discussed with others.
- Fluency - Quick and efficient recall of facts and procedures.
- Variation - Varying the way a concept is presented and carefully varying practise questions so that mechanical repetition is avoided, and thinking is encouraged.

Concrete, Pictorial and Abstract

- All learners are introduced to a calculation method for the first time using concrete manipulatives.
- Concrete resources from EYFS to Year 6 include: bead strings, Base 10, 100 number squares, Cuisenaire Rods, Place Value counters, and Numicon.
- After concrete, children will progress through to the pictorial stage, before moving to the abstract stage.
- During the pictorial stage, children will be taught to use the bar model and a number of other pictorial representations.
- The amount of time needed to progress through each stage is unique to each learner.

Mathematical Vocabulary

- We place a great emphasis upon the use of correct mathematical vocabulary and children developing this. Throughout the academy, children are taught and encouraged to use mathematical vocabulary.
- They will be exposed to this vocabulary, have it modelled by their teacher and be expected to use it themselves when justifying methods.

Mastering Calculations

- Our curriculum has a strong focus on mastery and therefore, if a child is fluent in a method for their year group, they should not be moved onto methods of calculation for subsequent year groups.
- Instead, children will be encouraged by their teacher to 'go deeper' within this method.
- This may involve using it in different contexts; using and applying it to other learning; using it with missing digits or values; explaining or experimenting with different.