Mathematics at Arunside

Intent

At Arunside, we aim for our children:

- To have a passion for mathematics;
- To understand where mathematics can take them in future careers;
- To have the resilience to tackle problems, including real-life problems;
- To make positive progress and attain to the best of their ability;
- To achieve fluency in order to free up their working memory and develop conceptual and procedural understanding;
- To be able to tackle increasingly complex problems and
- To be able to reason and problem solve mathematically.

Implementation

At Arunside, we follow a spiral curriculum approach. There is a significant body of literature which has proved that the spiral curriculum has been linked to improved learning outcomes. This approach to teaching enables children to:

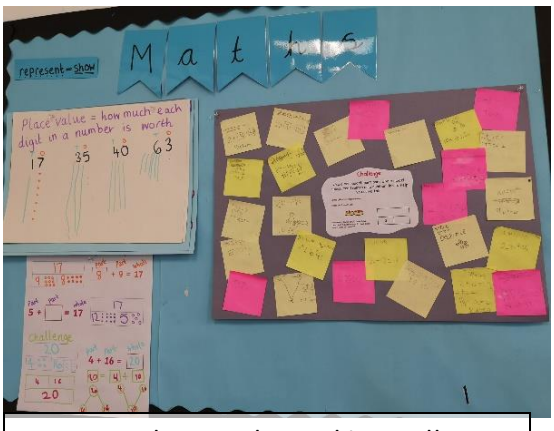
- Consolidate and master their learning before moving on;
- Practise and develop ideas that they may not have previously learnt or mastered sufficiently;
- Meet new learning that increases in complexity and
- Make connections between prior and new learning.

Maths is taught every day at Arunside. In maths from Years 1-6, you will see the following:

- **A retrieval-based starter.** This could be revisiting prior learning for revision purposes, revisiting prior learning to build new learning onto or addressing whole class misconceptions from the previous lesson.
- **Prior learning being revisited.** This is triggered with a recap from the previous lesson or, at the start of a new topic, learning from the previous year group.
- **Learning goals made explicit at the beginning of every lesson.** Teachers use the National Curriculum to ensure appropriate coverage. They have access to quality-assured support materials, such as White Rose and NCETM, to support with small step learning and resourcing.
- **Vocabulary introduced and displayed on lesson slides and working walls**. Teachers will explicitly teach the definition of key vocabulary. They will use this vocabulary in their questioning and in their modelling. Adults will encourage children to use this vocabulary in their verbal and written responses.
- **Mathematics working walls being used explicitly**. The aim is to provide children with worked examples of what they are currently learning, as well as any relevant vocabulary, misconceptions and steps to success.
- **New topics beginning with a core focus on fluency**. Children will be taught key number facts, procedures, concepts, principles and rules. Problems will be presented in a varied way (such as through standard and non-standard representations and varying contexts). Quick learners are challenged through varied problems, often presented in a non-standard way in order to encourage flexible thinking.
- **Concepts will be represented concretely, pictorially and abstractly to give deep mathematical understanding and provide inclusivity.** Children will be encouraged to move flexibly between these representations and use these to 'see' their mathematics in order to build conceptual understanding. Quick learners will be encouraged to use these representations to think in a creative and joined-up way.

- **Reasoning taught explicitly.** Once children have mastered fluency, children are given opportunities to make generalisations, develop an argument, justification or proof using accurate mathematical language. Teachers have access to '*Deepening Understanding*' and '*iSee Reasoning'* to support with resourcing and/or creating their own reasoning-style questions.
- **Problem solving being taught explicitly.** Once children have mastered fluency, children are taught to break down problems into smaller steps and encouraged to persevere. Children are presented with a variety of routine and non-routine problems.
- **Misconceptions being addressed and used as a tool for learning**. We call these '*Marvellous Misconceptions'* and these are displayed on our working walls. These give children an opportunity to reason mathematically, develop arguments, justify their decisions and compare efficiency of different strategies.
- **Children working independently**. This gives children the opportunity to practise, apply and master their new understanding. Questions will progress from familiar strategies onto non-routine questions.
- **Children working in groups and in pairs**. Children are given the opportunity to explore possible solutions and articulate their understanding.
- **Extension challenges provided.** These provide quick graspers to further apply, deepen and extend their understanding, through rich and sophisticated problems, rather than accelerating onto new content.
- **Teachers and teaching assistants working with (groups of) children.** Our teaching staff are used to provide targeted support or challenge to those children who need it most. Support will be in the form of scaffolding, reframing of questions, repetition of lesson content or, in the case of case of quick learners, challenge through questioning and/or modelling.
- **Flexible seating.** Expectations are high for all our children. You will see our children demonstrating high levels of confidence and engagement, as well as collaboration. Within class attainment seating maybe used on an occasional basis as a strategy of adapted teaching to meet the needs of groups of learners [EEF, 2021].
- **Specific learners being supported either before, within or after lessons based on their learning needs.** Pre-teaching is used as a tool for supporting specific learners begin lessons at the same starting point as their peers. These sessions may be delivered by the class teacher or teaching assistant. During lessons, teaching staff are deployed purposefully with the class teacher and teaching assistant working in collaboration. In lesson intervention is provided if required, with struggling learners mainly working with the class teacher, and follow-ups occur on a 1:1 or a small group basis.
- **Home learning, on our online platforms, 'PurpleMash', '*MyMaths*' and '*Times Tables Rockstars*', is set meaningfully.** All tasks are related to the work completed in class [EEF, 2021] and homework club is avaliable twice a week to support children in Years 5 and 6 in preparation for their transition to secondary school. Class teachers ensure homework is marked and timely feedback provided.

Children working collaboratively.



Up to date maths working walls.

In maths in our Reception class, you will see the following:

- **A formal maths lesson**. This will be taught whole class, delivered by a class teacher and supported by teaching assistants. Class teachers use Development Matters as a reference tool
- **Explicit mathematical continuous provision.** For example, you may see an adult-led mathematical game such as snakes and ladders or adult-led CP activity at the tables.
- **Continuous provision which involves non-explicit mathematical opportunities**. For example, you may see children learning about measurement through water play, reinforcing their problem solving skills or creating patterns using Lego bricks or singing mathematical songs and rhymes.
- **Rich mathematical learning environment**. As well as opportunities for maths through play, we have a maths display in both classrooms which is used by teachers to support number and place value. Physical maths resources are available for children throughout the day and children are taught how to use these correctly in lessons, as well as encouraged to explore them in free play.

Physical maths resources available and used by the children.

Number washing line to support number recognition, formation and sequencing.

Mathematics learning display supporting place value- counting and number recognition.

In Reception and KS1, 'Mastering Number' sessions are delivered:

'*Mastering Number*' sessions are delivered three times weekly. These are 15-minute long sessions, delivered in addition to regular mathematics sessions. By the time they leave Key Stage 1, our aim is to ensure our children are fluent in calculation and have demonstrate confidence and flexibility with number.

Inclusion

The spiral curriculum approach has several key benefits for all our learners:

- Key information is reinforced and strengthened each time a child revisits a topic;
- The curriculum allows for logical progression of a topic from simplest ideas to more complex ones.
- Children are encouraged to apply their knowledge and make connections with their learning and
- Any children who requires additional support or challenge can be identified in the early phases of the spiral.

At Arunside, although it is our expectation that the vast majority of our children move through the content at broadly the same pace, we recognise that there is plenty of opportunity to cater for childrens' differing needs:

- We provide children with complex SEND with individual targets that are appropriate to support their learning;
- Children who find retaining or understanding new vocabulary, including children with EAL, are supported at a word, sentence and text level. Subject specific and subject-specialised words which may have alternative meaning (e.g. volume, mean, power) are introduced explicitly at the beginning of sessions and used throughout a topic. Adults model reading questions aloud, teach children to identify key words and cross out irrelevant information when modelling how to break questions down and encourage correct use of key vocabulary in verbal and written responses;
- Children who are Pupil Premium, have tailored learning profiles which are regularly reviewed and updated to include personal strategies and interventions;
- Children who require additional time may be provided with intervention time, pre-teaching, worked examples on our working walls, scaffolded tasks which ensure focus is on the planned objective only and/or representations (including concrete) to support conceptual understanding;
- Children who find number fluency a challenge may be provided with concrete resources and visual supports, such as a multiplication grids, to remind them of number facts; opportunities at the start of a lesson to practise a required skill or encouraged to use online platforms, such as *My Maths* and *Times Tables Rockstars*, as part of their home learning;
- Literacy is supported in various ways such as providing learners with different resources, for example tinted paper exercise books or coloured overlays, dual coding, sentence stems and strategic use of adult support and/or pairing a learner with a more confident peer.
- Teachers may use a variety of strategies to support children who struggle with attention and change such as: behaviour specific praise, incorporating a learner's interests into questions and giving a set number of questions to complete to name but a few;
- We provide additional support for struggling learners in the form of intervention groups for targeted groups of children. We use our Covid catch-up funding to run an intervention group, led by a qualified teacher, to support Pupil Premium children which involves pre-teaching or reinforcement of previous work. Our learning support assistants may also provide 1:1 precision teaching or pre-teaching for children outside the ormal mathematics lesson and
- We work with parents to support their childrens learning at home. We have developed a suite of online tutorial videos. Parents in EYFS are provided with clear guidance on our school website as to how they can best support mathematical learning at home through cooking, routines and play.

Maths in the wider curriculum

- **Provide mathematical opportunities in other areas of the curriculum**. For example, in science, children measure forces in Newtons and statistics (such as bar charts) are used in geographical fieldwork.
- **Provide mathematical opportunities in clubs and internal and external competitions**. We have a STEM club where Year 3 children use data handling to work towards the CREST award and our ROAR club for Year 6s which had them looking at speed limits of emergency service vehicles when designing an emergency drone. The learning of times tables is promoted on Times Tables Rockstars in competitions such as 'England Rocks'. Children are also given the opportunity to represent Arunside at external mathematics competitions, such as the Christs Hospital Maths Competition.

Assessment

- On an everyday basis, teachers continuously monitor progress through regular marking of books, precise questioning and formative assessment such as independent work, weekly arithmetic PiXL testing and times tables testing.
- Summative assessment takes place on a half-termly basis in Years 2-6 and question level analysis is used by teachers to identify gaps and plan to address these. It is the role of our Raising Standards Lead to monitor this.
- We use Insight as an assessment tracker, as well as a tool for identifying next steps for all children, including those working at below year group expectations.

Leadership, monitoring and review

The monitoring of the mathematics teaching and pupil progress is a shared responsibility of class teachers, the two mathematics subject leaders, Raising Standards Lead and the Senior Leadership Team.

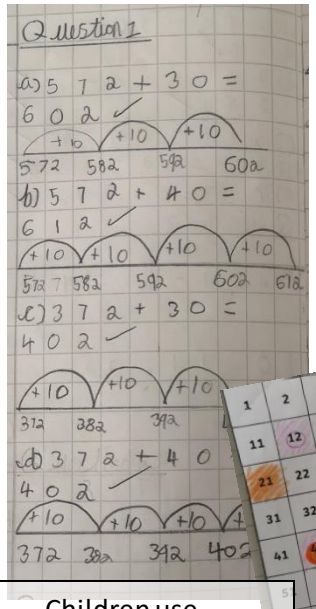
- Teachers are provided with a Calculation Policy to ensure methods, language and represents are consistently used;
- Teachers have contributed towards a Long Term Plan for mathematics which serves a dual purpose: it enables class teachers to pace their curriculum as well as provide leaders with a snapshot of what is being taught and when;
- Staff are provided with CPD to ensure the they are using the most up-to-date strategies. Training is delivered either in the form of INSET days or staff meetings which are then disseminated to other members of staff in weekly Key Stage meetings. In 2024/2025, teachers are developing their understanding of dyscalculia and using strategies to support children with these tendencies.
- We conduct learning walks, book looks, pupil voice and teacher voice surveys in order to monitor what is going well and what we want to improve.
- Subject leaders attend maths network meetings, as well as the local leaders of mathematics education (LLME) meetings, with the aim to continuously improve the quality of teaching and learning at Arunside. In 2024/2025, subject leaders are undertaking additional CPD to develop their abilities in leading mathematics more effectively.
- The school's governing body receive regular updates to inform them of the plans to drive forward the teaching and learning of mathematics, as well as standards achieved to date.

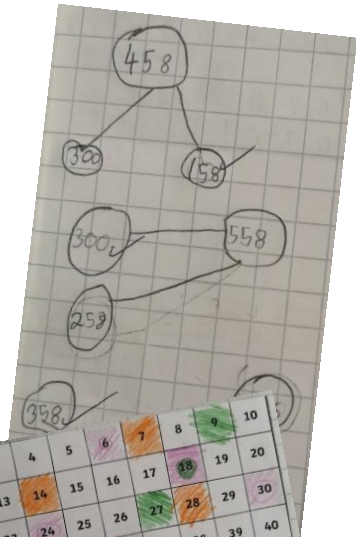
Development

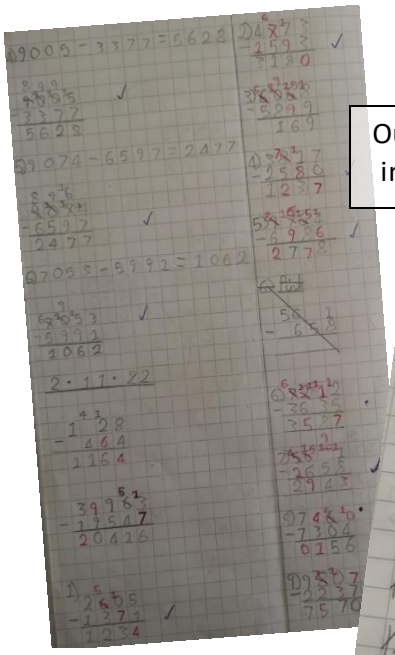
We have main focuses in mathematics at Arunside for the 2024/25 academic year:

1. **Improve fluency to support children to 'know more and remember more'.** Subject leaders will monitor the quality, frequency and impact of retrieval practice within lessons as well as weekly PiXL testing which will focus on arithmetic skills.
2. **Support and develop teaching staff's knowledge and use of mastery principles when planning and delivering lessons.** Subject leaders will provide training during staff meetings and TA training sessions. The impact of which will be improvements in children's conceptual and procedural fluency.
3. **Improve attainment and progress of PP and SEND learners.** Subject leaders will meet with class teachers to discuss the provision in place to support the needs of these specific groups of learners and continually look for ways we can support them to achieve their potential in mathematics both in lessons, across the curriculum and in everyday life.

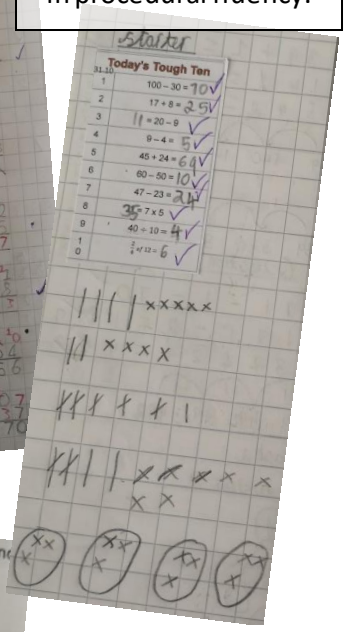
Impact



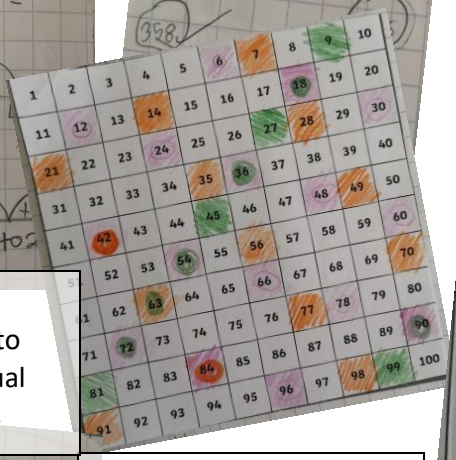


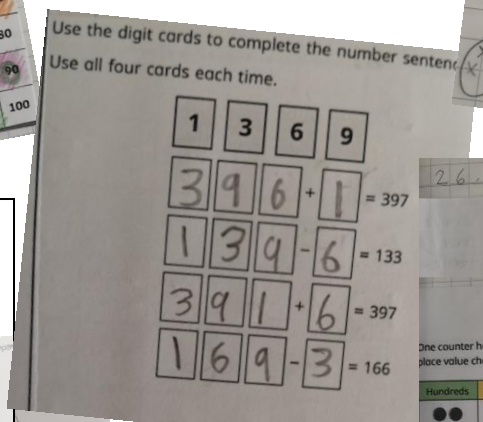


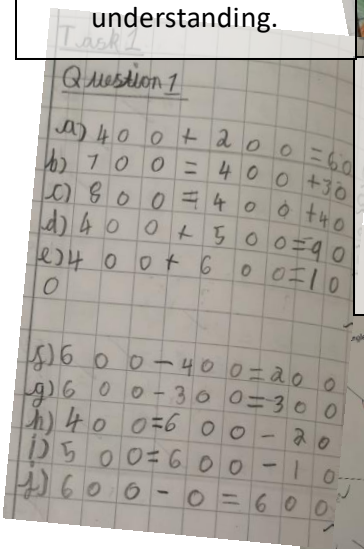
Our children are strong in procedural fluency.



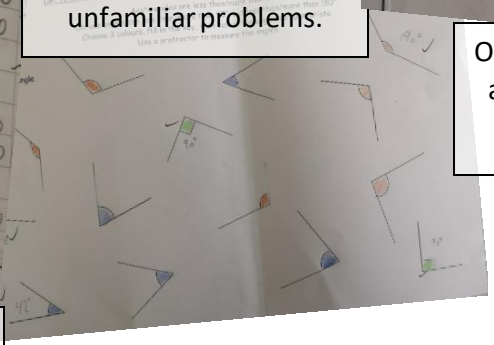
Children use representations to support conceptual understanding.



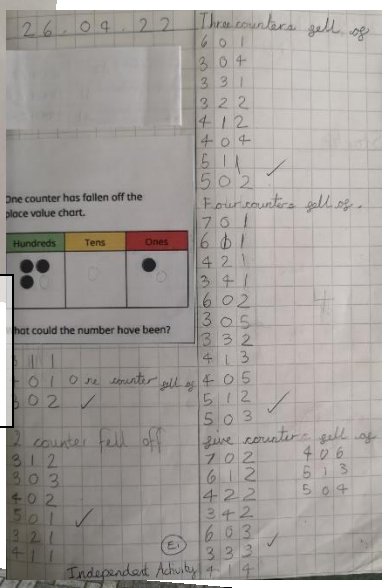




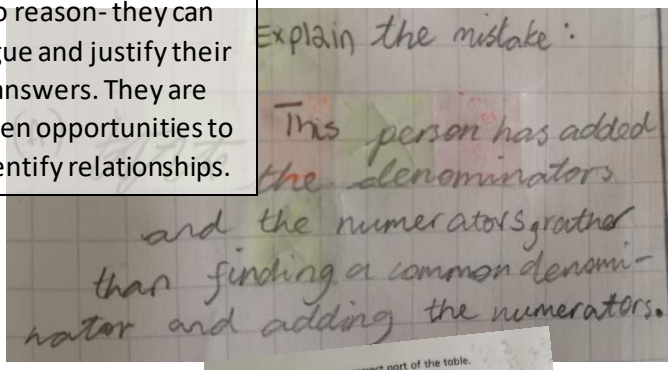
Children are beginning to spot mathematical patterns through use of variation and use these more challenging or unfamiliar problems.

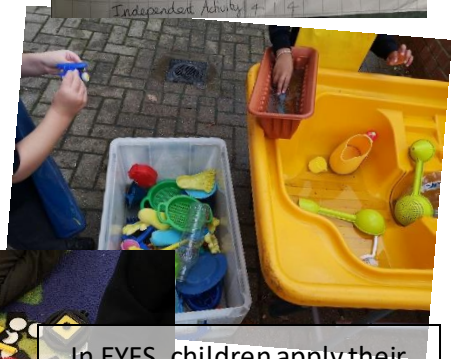


Our children are able to apply their fluency in problem solving.

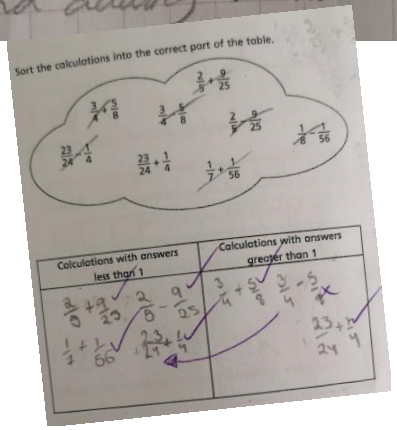


Our children are able to reason- they can argue and justify their answers. They are given opportunities to identify relationships.





In EYFS, children apply their mathematical knowledge in problem solving and free play. They use correct mathematical vocabulary.



We perform well in external competitions. In 2022, we came 6th in the Christs Hospital Mathematics Competition.

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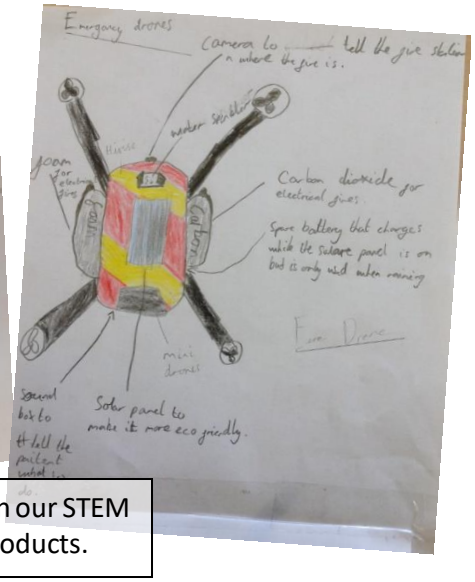

Maths is used effectively in our STEM Club when designing products.