

## In Maths, a Roundwood leaver will know that...



*...understanding maths helps us think critically about the world around us and have better reasoning abilities, increasing our ability to solve problems and look for solutions. Learners will appreciate the prevalence of maths in all we do, from baking and planning finances; the complexities of maths which occur naturally such as Fibonacci sequences and sunflowers and the work of mathematicians in their broadest sense as engineers, scientists, health care workers, sailors and designers. Through the development of mathematical fluency, pupils develop reasoning skills, articulating their ideas and using them to solve increasingly complex problems which can be applied across and within the curriculum.*

Mathematics is 'essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment' (National Curriculum)

At Roundwood Primary we all work together to nurture and challenge each individual child through our provision, striving to create life-long learners, capable of facing challenges and recognising their own needs and achievements. Maths is taught as 2 smaller classes per year group, in order to give the most personalised learning possible and provide children with a deeper understanding of the world around them with the ability to reason, explain and justify mathematically and the capacity to learn from mistakes. Through carefully planned lessons and activities, we endeavour to instil a 'sense of enjoyment and curiosity' about mathematics in all children.

The domains covered in mathematics are:

- Number, place value and rounding, approximation and estimation
- Addition and subtraction
- Multiplication and division
- Fractions, Decimals, Percentages Ratio and Proportion
- Algebra
- Statistics
- Measurement
- Geometry: properties of shapes, position, direction and motion

We have high expectations of learning and behaviour and regularly celebrate achievement, collaboration and effort. Teachers exploit cross curricular links wherever possible and establish maths learning within a variety of contexts. Special maths days occur each year to further develop investigative and real-life context work, which the children certainly enjoy.

Our vision and aims are aligned with the National Curriculum standards that are expected for each year group, which provide guidance for their implementation. Here, we follow the mastery approach to maths learning, which enables children to be fluent and confident, making connections across topics and subjects within maths. We deliver a CPA approach, where varied concrete resources help all children to understand the concepts being taught, then moving on to a pictorial representation using ideas developed in the concrete phase, before embarking on the abstract form of formal written methods of recording. These universal objectives ensure continuity and progression in the teaching of maths across our school, so that children are provided with a variety of opportunities to develop, extend and deepen their mathematical skills in and across each phase of education.

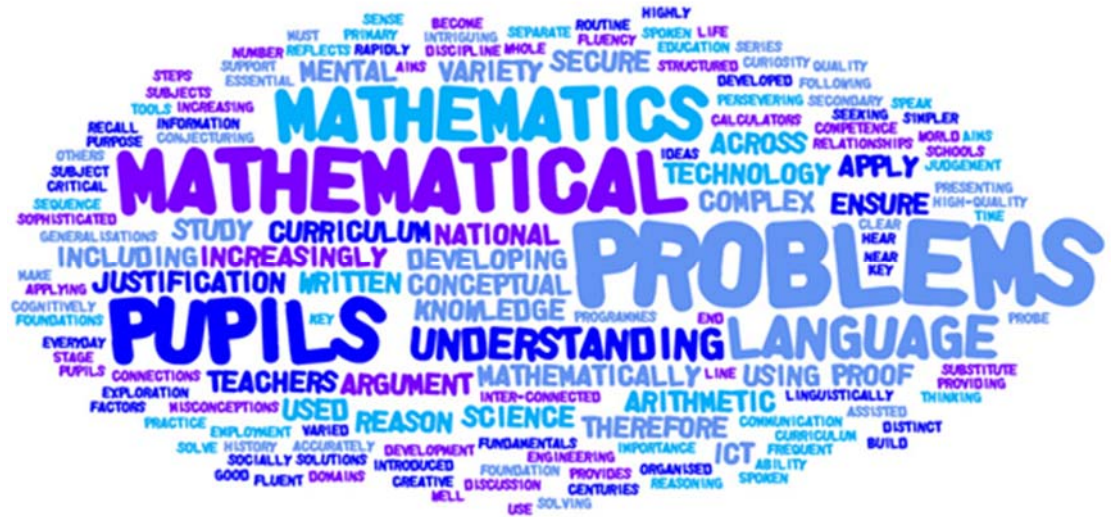
In Nursery and Reception, maths learning follows the Early Years Foundation Stages Framework. Children are given opportunities to extend their understanding of language learning through play and investigation, developing their characteristics of learning every day. In key stages 1 and 2, lessons engage children in the development of mental strategies, written methods, practical work, investigational work, problem solving, mathematical discussion, consolidation of basic skills and number facts. We also ensure opportunities for group work, paired work, whole class teaching and individual work. Following last year's introduction of the mastery approach, this year we are developing our fluency skills through daily 15 minute mental maths sessions focusing on number and place value, addition and subtraction, and multiplication and division.

Each week children who are especially able at maths work in small groups with a maths specialist. Our 'extra maths' pupils in Year 5 and Year 6 work alongside other primary schools and Roundwood Primary School hosts this initiative. They explore mathematical ideas through investigation and discussion. We offer these children the opportunity to study in greater depth, rather than encouraging them to progress quickly through attainment targets.

There is a super website that helps parents see the bigger primary education picture across the UK with helpful documents, booklets and videos to watch including ideas for fun at home when you click on the relevant Year group tabs.

<https://www.oxfordowl.co.uk/for-home/at-school/maths-at-primary-school/>

ARITHMETIC... and mental maths fluency: Arithmetic is at the core of almost every single Maths teaching area and essential to the Reasoning and Problem Solving areas too!



Fluency in numbers is an essential first stage

in developing conceptual understanding in maths. We understand the importance of daily arithmetic practice at Roundwood and children do a daily session, sometimes outside of the maths lesson to develop that area of Mathematical understanding.

Below we explore 8 reasons why it is important to focus on teaching excellent KS2 arithmetic skills through daily arithmetic practice, and how to get it 'right'.

### 1. Arithmetic Skills Are Essential Building Blocks For ALL areas of Maths

Pick any topic in maths and somewhere there will be arithmetic skills wrapped up inside.

### 2. Arithmetic Is A Key Basic Skill for Adults and children throughout life. Maths is a lifelong learning skill.

Arithmetic skills are used by adults and children alike throughout their daily lives. Have a think about what you have done so far today; it's almost certain that you will have used some form of mental arithmetic.

- Did you work out how much longer you've got until you need to get out the house this morning?
- Maybe you looked at your speedometer to work out how much to reduce or increase your speed by?
- Or you might have worked out how many children were absent from your class this morning.

### 3. Developing Conceptual Understanding Of Arithmetic Saves Time On Calculations

Developing a conceptual understanding of arithmetic is hugely important. After all, for pupils to confidently carry out calculations, they need to understand why calculations work, not just the steps to a successful answer.

This is why rote learning of times tables etc. is often actively discouraged, as it encourages the view that Maths is a set of facts and processes, rather than an interconnected subject that is full of flexibility.

When pupils have a conceptual understanding of their arithmetic skills, they are more likely to be able to carry out questions mentally, saving all important time.

#### 4. Fluency In Arithmetic Helps Pupils To Flexibly Approach Maths Problems

When pupils are fluent in arithmetic, they begin to understand the flexibility needed to succeed in Maths, and the different ways that a Maths problem can be approached. For example, if you ask pupils to double 36 in their heads, and then explain to their partner how they did it, you'll witness many different approaches.

Some may double 30, double 6 and add the results. Others might double 40 and take away 8. Some might even double 35 and add 2. Of course, there is no 'best' way in Maths. Yet, understanding the ways that Maths is connected and having true fluency in arithmetic helps children to understand and approach almost any problem.

#### 5. The KS2 Arithmetic Paper Is Highly Weighted In KS2 SATs

In Key Stage 2 SATs, the Arithmetic Paper accounts for 36% of a child's overall KS2 Maths SATs raw score. That's 40 out of 110 marks!

In 2018, only 55.4% (61 out of 110 marks) was required to meet the expected standard and gain a scaled score of 100.

When schools analyse their SATs result breakdown (see this great free SATS 2018 resource for help with this), they often find that children that score well in the Arithmetic Paper are more likely to score well and in their Reasoning Papers. Therefore, they achieve expected standard.

#### 6. Fluent Arithmetic Skills Are Also Needed To Succeed In The KS2 Reasoning Papers

There are also a high proportion of arithmetic focused marks in the KS2 Reasoning Papers. A large number of questions in SATs papers assess reasoning through arithmetic focused content objectives, and this doesn't count questions which primarily cover another area (e.g. percentages, measures, number properties) but contain an arithmetic element.

#### 7. Pupils Need To Correctly Identify And Apply Written/Mental Strategies For The KS2 Arithmetic Paper

With the paper designed to include squared working areas after each question, pupils often take up time time carrying out mental questions using a written method. As such, they're not able to complete the full paper - when they might be fully capable of answering the final questions!

#### 8. Maths Arithmetic Skills Need Regular Practice To Maintain True Fluency

Pupils need to be using their arithmetic skills each and every day in order for them to maintain the confidence and fluency needed to successfully tackle any exams, but more importantly to be able to use it in everyday life.

The grasp of the core mathematical concepts is solid. Using resources to demonstrate how and why is crucial.

The use of correct maths terminology is also vital. We try to avoid maths tricks as they don't develop the understanding as to why the answers are and can lead to more confusion for the children.