Maths the St Anne's Way

'Pure mathematics is, in its way, the poetry of logical ideas.' Albert Einstein

At St. Anne’s we believe that mathematics 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.

Without mathematics, there’s nothing you can do. Everything around you is mathematics. Everything around you is numbers.”
— Shakuntala Devi, Indian writer and mental calculator

At St Anne's Primary School, we aim to provide children with a mastery curriculum where all children develop a deep understanding of mathematics. Teaching for mastery involves knowing 'why' as well as knowing 'that' and knowing 'how'. It means being able to use one's knowledge appropriately, flexibly and creatively and to apply it in new and unfamiliar situations.

Mastery of the curriculum requires that all pupils:

- use mathematical concepts, facts and procedures appropriately, flexibly and fluently;
- recall key number facts with speed and accuracy and use them to calculate and work out unknown facts;
- have sufficient depth of knowledge and understanding to reason and explain mathematical concepts and procedures and use them to solve a variety of problems.

National Curriculum

‘Mathematics is a creative and highly interconnected 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’.

The national curriculum for mathematics aims to ensure that: ‘all pupils become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately; reason mathematically 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 sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

What are the key strands of the subject that the pupils will learn?

We aim to build high levels of competence in the subject specific skills of:

- becoming **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- **reasoning** mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- **solving problems** by applying their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of smaller steps and persevering to seek solutions.

The programs of study are organised into distinct domains but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems.

The topics covered are:

- Number and place value
- Addition & subtraction
- Multiplication & division
- Fractions
- Measurement
- Properties of shape
- Position & direction
- Statistics

With the addition of the following topics at Key stage 2 (from Year 4 onwards):

- Fractions (including decimals & percentages)
- Ratio & proportion
- Algebra

Maths at St Anne's

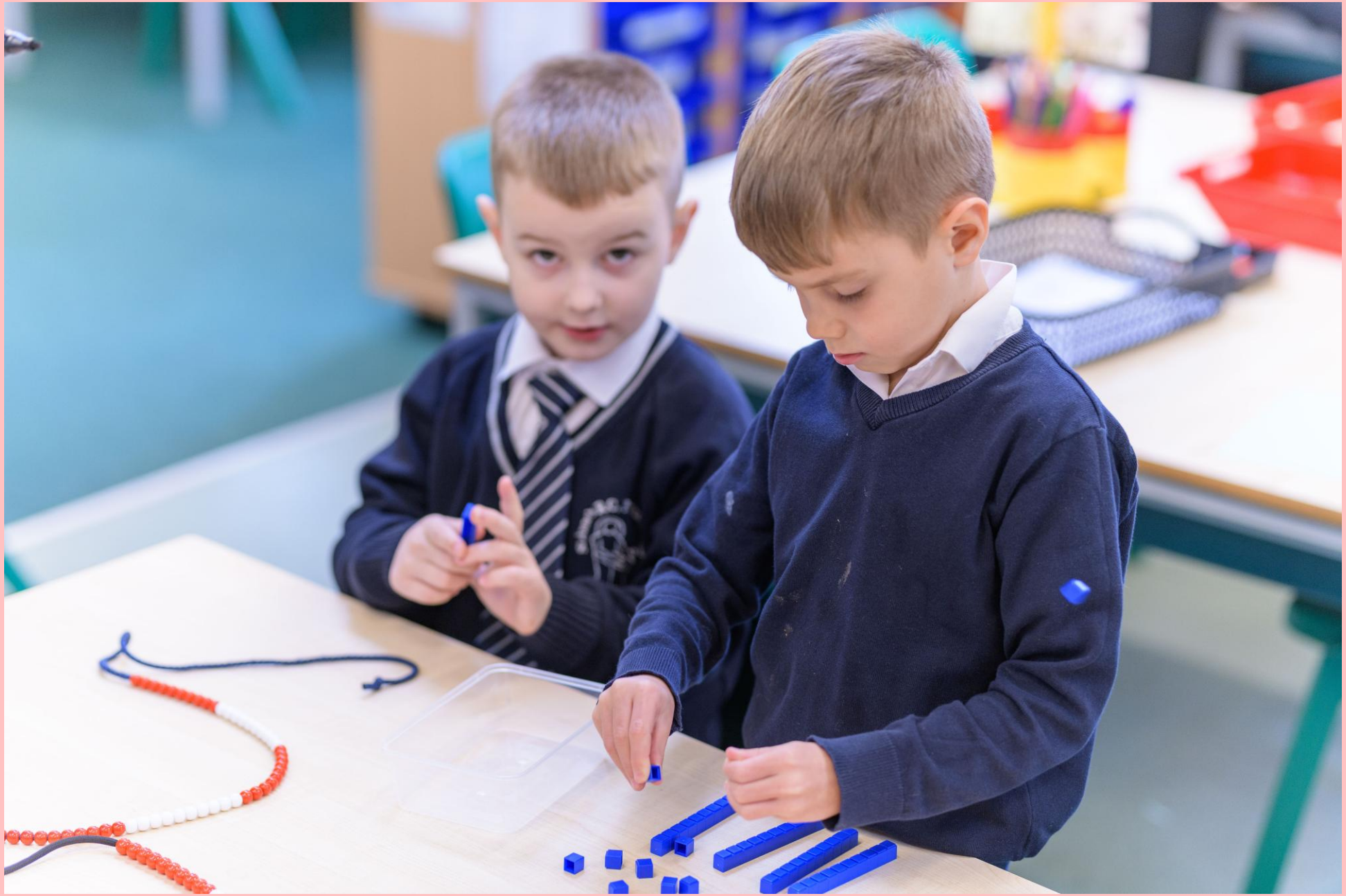
I love Maths and I love it when I get answers right. I also like working from the textbooks.

I like it when we use the Maths equipment like Numicon, cubes and ten frames because it's lots of fun!

I have lots of things to help me in my Maths lessons like number lines, counters, base 10 and cubes. There's also the working wall too if I forget what something means.

Maths is important for my life because I need to know how to look after my money when I'm older. I need to know if I have enough money to buy something.

In Maths we always explain our answers. It's okay to get answers wrong the first time. We can keep trying and learn more!



EYFS

In the EYFS (Nursery and Reception), the teaching of maths is based on the area of learning Mathematical Development. This is broken into two strands;

- **Number-** providing children with opportunities to **develop** and improve their skills in counting, understanding and using numbers, calculating simple addition. and subtraction problems.
- **Numerical Pattern** to describe and explore shapes, space and measures.
- In Reception, one 20 minute session of maths is taught daily using the White Rose materials. Counting takes place daily.
- Children have one focus session per week in ability groups based on the maths being learnt that week.
- Maths is incorporated into all of the children's learning. Ensuring both the classroom area and the outdoor environment has a maths enhancement which is changed regularly.

KS1

- In Key Stage One maths lessons are 1 hour using the White Rose Maths resources. Lessons begin with daily counting and flashback Four questions to revisit previous learning

- An additional Arithmetic session takes place once per week to consolidate the four operations.

- The children are provided with time to practice fluency with addition and subtraction facts using the online app Numbots. This can also be accessed at home

- Concrete resources are used to support children's learning new mathematical concepts and deepen understanding.

KS2

- Year 3-6 teach mathematics for one hour each day using the White Rose Maths resources. Lessons begin with daily counting and Flashback Four questions to revisit previous learning.

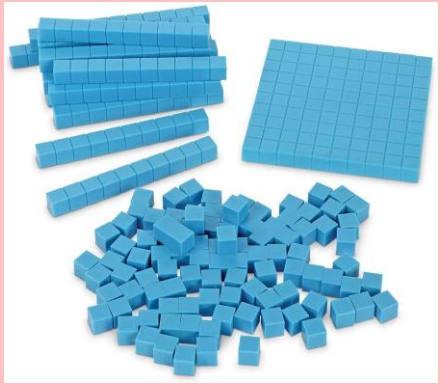
- An additional arithmetic session takes place once per week. The arithmetic session focuses on place value, the four operations and fractions. (Plus, decimals and percentages for Y4 onwards.)

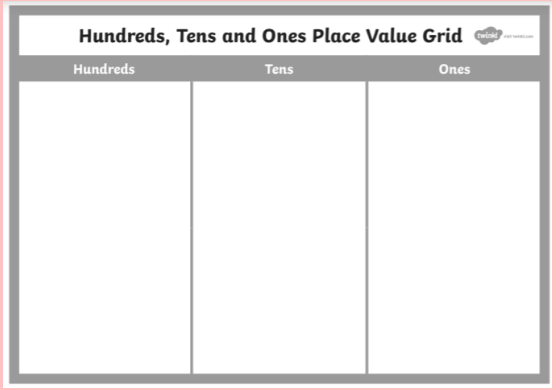
- The children are provided with time to build fluency with their times tables using Times Table Rockstars. This can also be accessed at home.

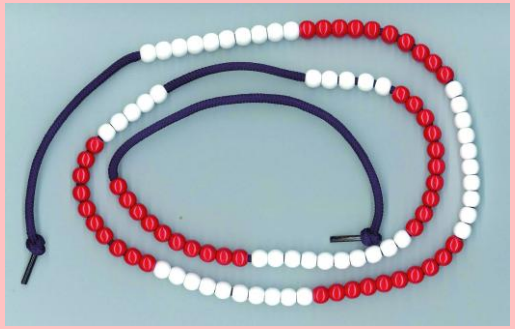
CPA

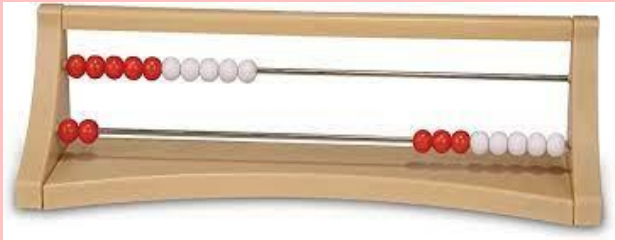
When introduced to a new concept, children should have the opportunity to build competency by taking this approach.

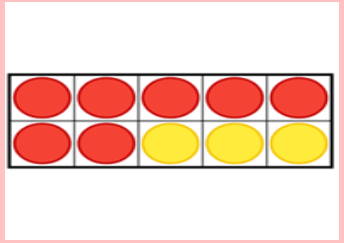
- **Concrete** – children should have the opportunity to use concrete objects and manipulatives to help them understand what they are doing.
- **Pictorial** – alongside this, children should use pictorial representations. These representations can then be used to help reason and solve problems.
- **Abstract** – both concrete and pictorial representations should support children's understanding of abstract method



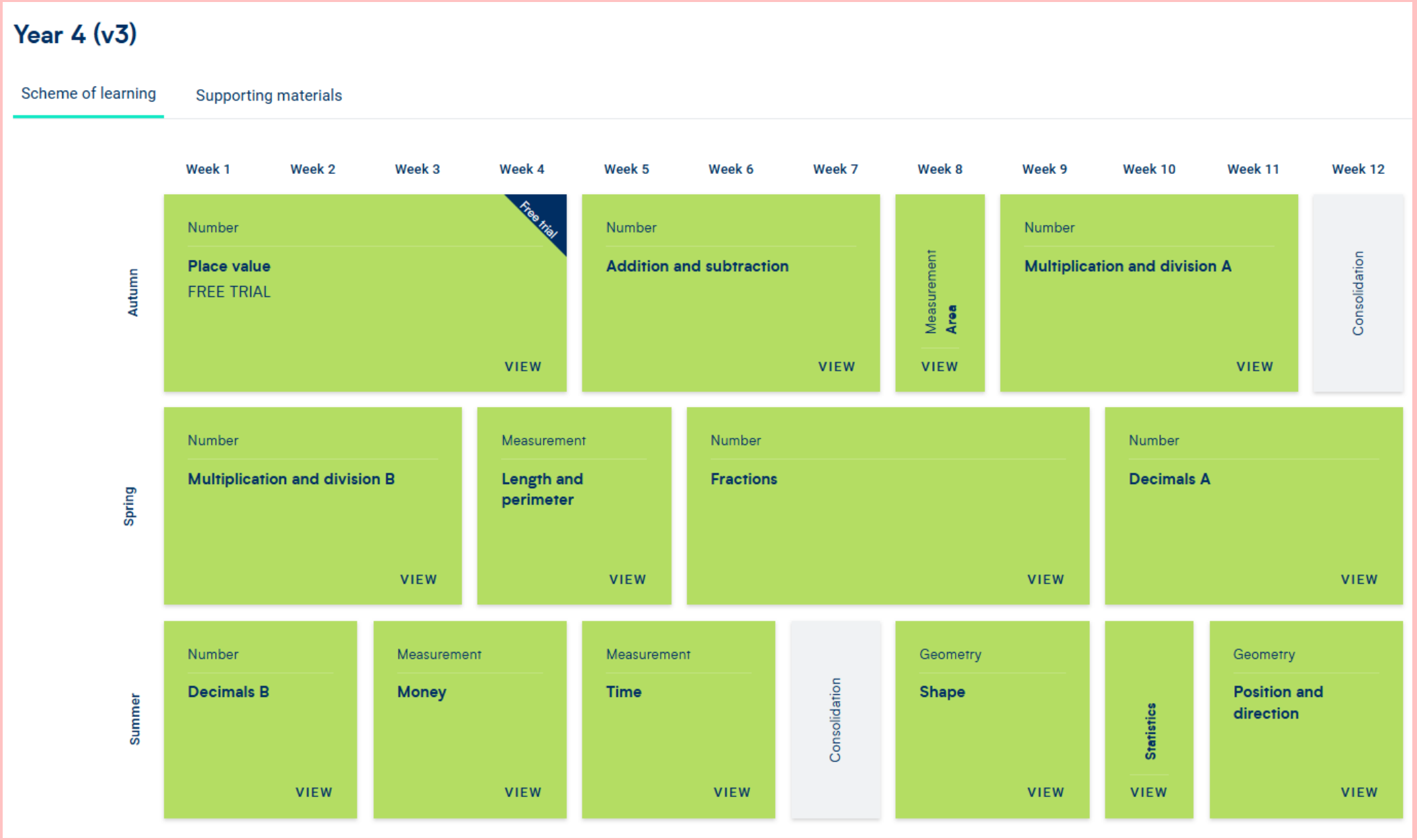








Example Long Term Plan



Multiplication Timetable

Y1	To Count forwards & backwards in 2s, 5s, 10s
Y2	To revise counting forwards and backwards in 2, 5, 10, 3 **To learn the multiplication & division facts for 2, 5, 10, 3 times tables**
Y3	To revise the multiplication facts for 2, 3, 5, 10 times tables. **To learn the multiplication and division facts for the 4, 8, 9. 11 times tables**
Y4	To revise the multiplication facts for 2, 3, 4, 5, 8, 9, 10, 11 **To learn the multiplication and division facts for the 6, 7, 12 times tables** **Times table Test**
Y5 /6	Revise all times table facts up to 12 x 12

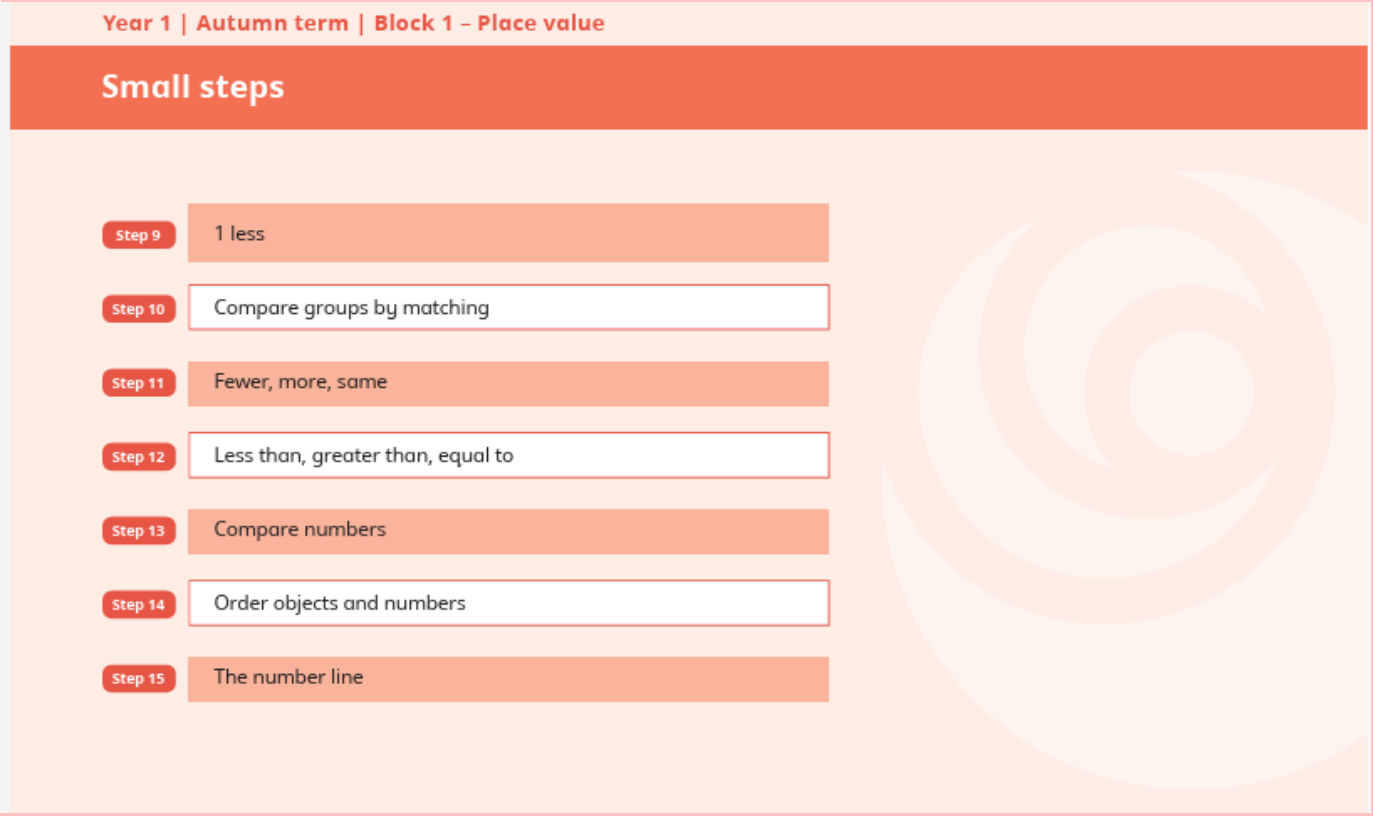
Example Medium Term Plan

Year 1 | Autumn term | Block 1 – Place value

Small steps

Step 1	Sort objects
Step 2	Count objects
Step 3	Count objects from a larger group
Step 4	Represent objects
Step 5	Recognise numbers as words
Step 6	Count on from any number
Step 7	1 more
Step 8	Count backwards within 10

White Rose MATHS



Year 1 | Autumn term | Block 1 – Place value

Small steps

Step 9	1 less
Step 10	Compare groups by matching
Step 11	Fewer, more, same
Step 12	Less than, greater than, equal to
Step 13	Compare numbers
Step 14	Order objects and numbers
Step 15	The number line

Links with other subjects

Mathematics is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. At St Anne's cross curricular links are made to other subjects to embed Maths knowledge and understand how it applies to real life contexts.

Y1 Map work and Beebot topic links to Position & Direction

Y6 using measuring and marking skills to cut square sectioned wood

Measuring when baking

Example of the guidance for each small step

Introduce parts and wholes

White Rose MATHS

Notes and guidance

In this small step, children begin to think about parts and wholes.

While this reinforces and reminds children of what they have learned in Reception, they are unlikely to have been formally introduced to the language of "parts" and "whole".

Ensure time is spent identifying the parts and the whole during activities. Allow children to explore and notice different compositions; for example, 5 can be composed of 2 and 3 or 1 and 4 or 1 and 1 and 3. Encourage children to recognise that numbers can be composed of two or more parts.

At this stage, children should be given the opportunity to explore this concept through play and physical activities. The part-whole model is introduced in the next step.

Things to look out for

- Children may make mistakes counting. Encourage children to subitise (to recognise instantly how many objects there are without counting).
- Children may mix up what the parts are and what the whole is. Physical activities can help with this, such as children standing in two hoops to make the parts, then physically coming together to make the whole.

Key questions

- Where is the whole?
- Where are the parts?
- Is the whole greater than the part? Is the whole always greater?
- Can zero be a part?
- Can the parts be swapped around?

Possible sentence stems

- _____ is a part.

  _____ is a part.

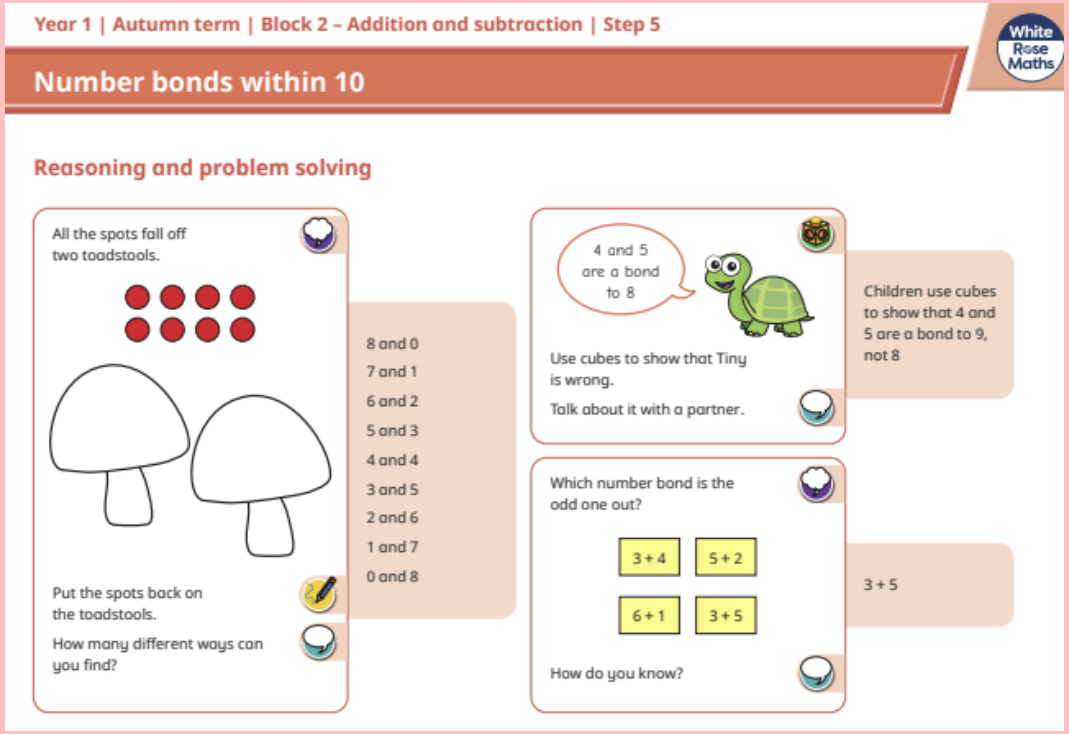
  The whole is _____
- The whole is _____ than the part.
- There is/are _____ in each part.

National Curriculum links

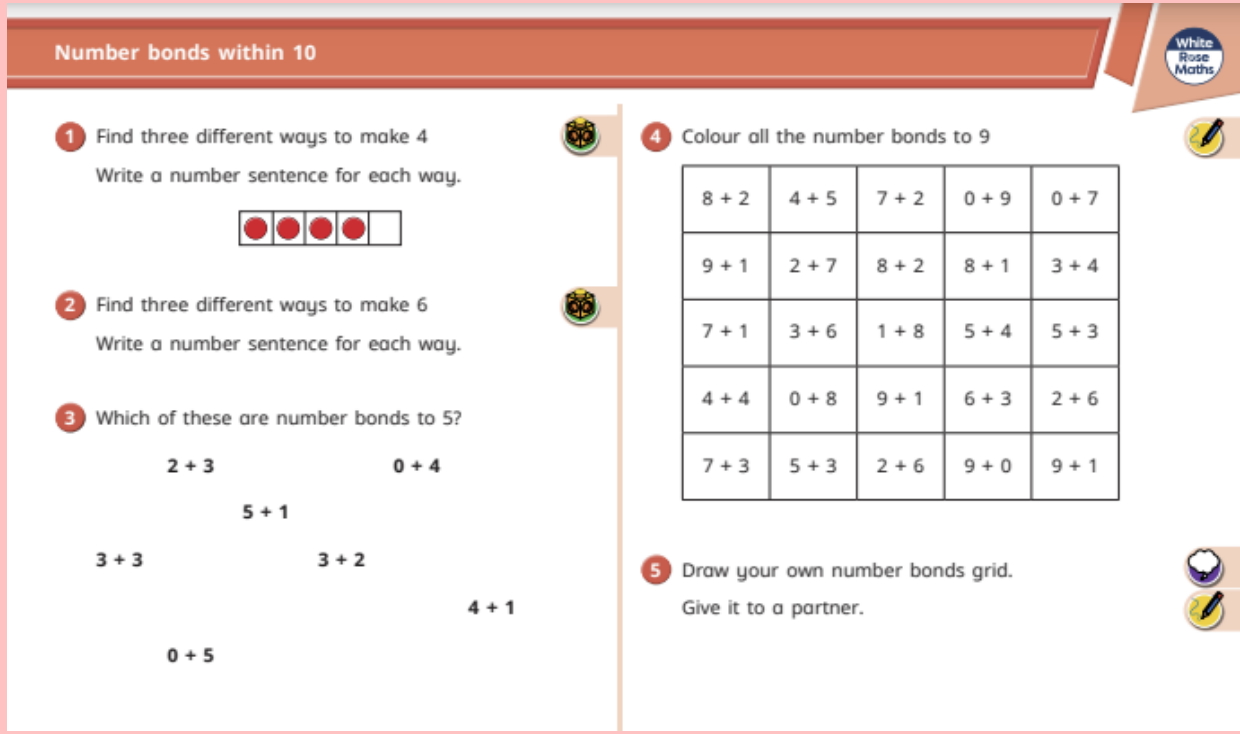
- Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer)

Small steps

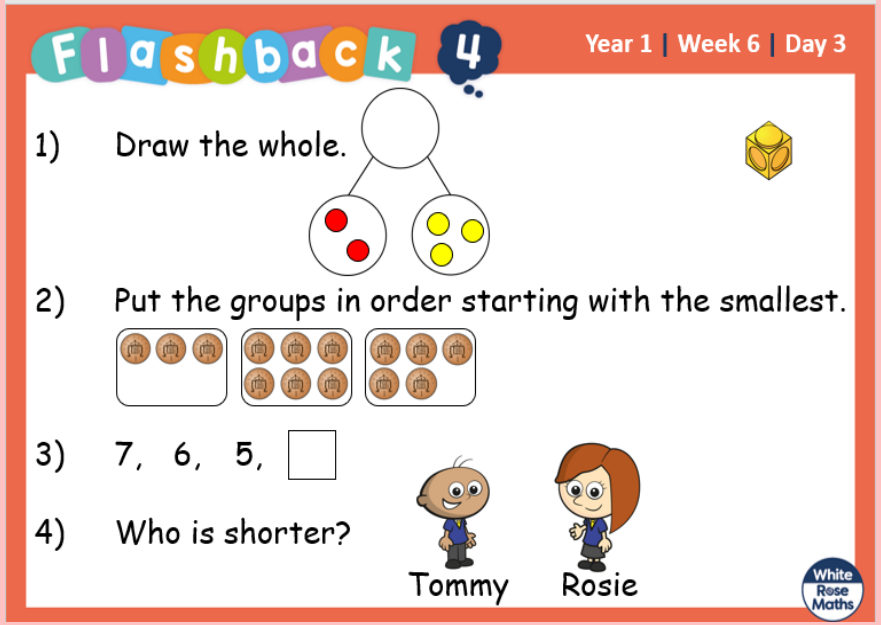
Step 1	Introduce parts and wholes
Step 2	Part-whole model
Step 3	Write number sentences
Step 4	Fact families – addition facts
Step 5	Number bonds within 10
Step 6	Systematic number bonds within 10
Step 7	Number bonds to 10
Step 8	Addition – add together



Problem solving activities



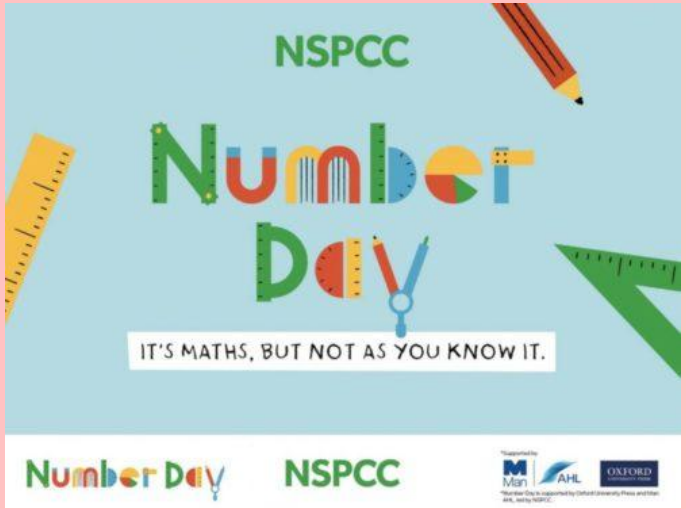
Pupil activities



Flashback Four revision questions

Enrichment Opportunities

- After School Clubs for basic skills, Arithmetic and TTRS
- Number Day 5th February 2027
- TTRS in school competitions



Impact

<u>What knowledge, skills and concepts do pupils gain from their learning in the subject?</u>

As a result of providing the children with a mastery curriculum and frequent arithmetic lessons, we expect that the children can:

- instantly recall times table facts and number bonds (including the inverse)
- use the correct vocabulary to explain their methods or reasoning
- apply their skills to other areas of the curriculum e.g. science, Geography, Design Technology
- use different methods to approach a problem-solving task
- choose efficient and appropriate methods for answering questions
- use their prior knowledge to approach unfamiliar questions or problems
- make links between the topics they have studied
- apply their skills in their daily lives e.g. money, cooking, following directions
- accept that making mistakes is a part of the learning process

Assessment

How is pupils' learning and progress assessed?

Assessment of pupil progress is undertaken through a variety of ways using teacher judgement

- end of term NTS assessments
- end of key stage SATs assessments in Y2 & Y6
- weekly arithmetic scores
- daily classwork
- observations of pupil's ability to explain their mathematical thinking in lessons

These assessments are uploaded termly onto the school's tracking system iTrack. The outcomes of these assessments are used by class teachers to target specific children to reach age-related through intervention.

Useful Links for Children

- http://amathsdictionaryforkids.com/
- https://www.mathsisfun.com/index.htm
- http://mathszone.co.uk/
- https://www.multiplication.com/
- https://primarygames.co.uk/
- https://www.topmarks.co.uk/
- 1 Minute Maths https://whiterosemaths.com/1-minute-maths
- EYFS resources https://whiterosemaths.com/homelearning?year=early-years

Useful Links for Parents

- Oxford Owl includes a range of activities, top tips and eBooks to help your child with their maths at home.

https://www.oxfordowl.co.uk/maths-owl/maths

- Maths 4 Mums and Dads explains some of the milestones children make between the ages of 3 and 11 years-old.

http://www.maths4mumsanddads.co.uk/index.php

- Free workbooks are available to print from the White Rose Maths website

https://whiterosemaths.com/parent-resources

Online Subscriptions

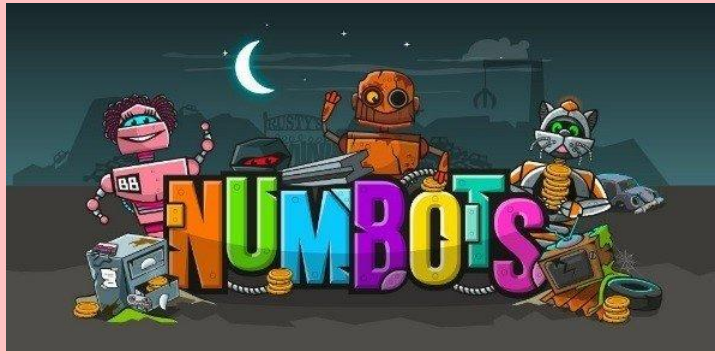
Apps to support fluency with number

- Times Table Rockstars

https://ttrockstars.com/

- Numbots

https://play.numbots.com/

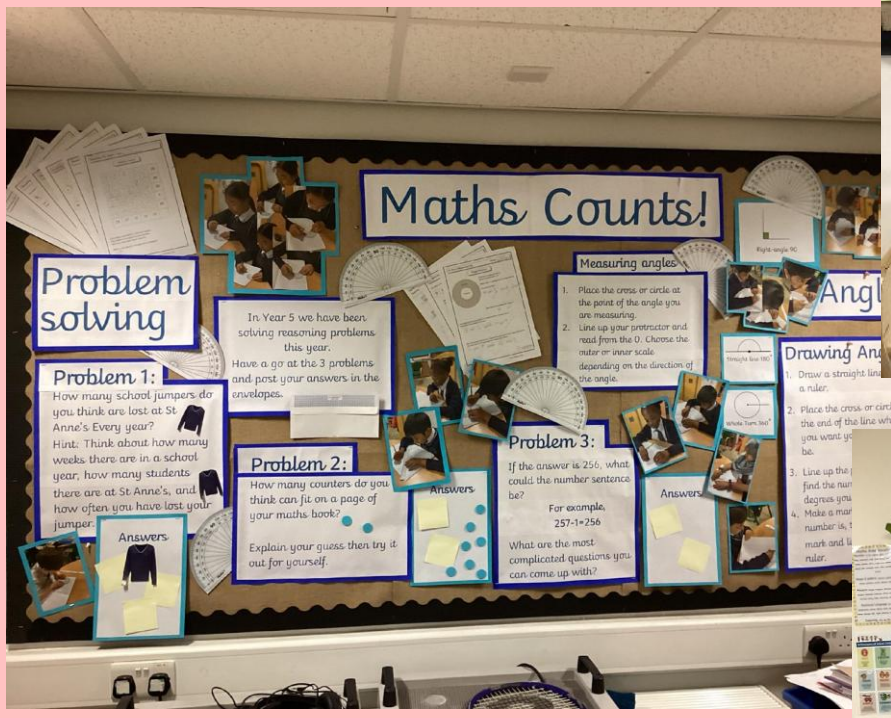


Cultural Capital

With our firm belief that knowledge is transferable, our pupils are given every opportunity to participate in a wide range of learning experiences beyond their classroom. These experiences include trips to museums, theatres, adventure centres and community projects in and around Manchester. They are also given regular opportunities to participate in school and national competitions to encourage more positive attitudes towards Mathematics. Cultural Capital is the essential knowledge that children need to prepare them for their future success – in the world of work, in relationships forged throughout life and as a valued contributor to society. When beginning their primary school journey in the EYFS, many children arrive to school with different and sometimes more limited experiences than others. Therefore, our aim is to give children the knowledge and skills to prepare them for what comes next in their lives. This includes the relevant vocabulary needed throughout their education and the opportunity to link maths to real-world problem solving.

Celebration

Display



We recognise children's achievements in Maths regularly with Celebration assemblies.

What are our school's strengths?

- Regular monitoring takes place for pupil voice, book looks and lesson drop-ins.
- Regular CPD opportunities for teachers and support staff on the Mastery approach using the White Rose Maths online materials.
- Pupil voice demonstrates that pupils are enthusiastic about Maths and enjoy the subject. They are engaged in Maths lessons
- A healthy budget means we have access to White Rose Maths premium subscription and the workbooks. The children have commented that they enjoy using the workbooks and the workbooks also reduce teacher workload.
- Classes have access to a good amount of concrete resources and subscriptions like TTRS / Numbots.
- Flashback Four used at the beginning of lessons to review prior learning.
- The long term plans have been created so that maths skills are taught before they are used in other subjects.

How can we improve?

- Regular teacher and teaching assistant voice
- Continue to provide Parent workshops
- Training on Talk for Maths so staff feel confident using stem sentences in lessons, to work with Oracy lead
- Subject Lead to look at CPD for new staff on the Concrete Pictorial Abstract approach
- Subject Lead to look at Maths enrichment activities e.g. Money Week