Maths at Barnsbury Primary School and Nursery

Year 4

Aims of the session:

-To outline the maths curriculum and end of year expectations

-To share some of the activities in a typical lesson

-To share our ethos toward the teaching of Maths (CPA approach, Numicon , White Rose)

-To provide suggestions as to how you can support your child at home (including Growth Mindset)

The National Curriculum:

The principal focus of mathematics teaching in lower Key Stage 2 is to ensure that **pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value.** This should ensure that **pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.**

At this stage, pupils should develop their ability to **solve a range of problems, including with simple fractions and decimal place value**. Teaching should also ensure that pupils **draw with increasing accuracy and develop mathematical reasoning** so they can **analyse shapes and their properties**, and confidently describe the relationships between them. It should ensure that they can **use measuring instruments with accuracy** and make connections between measure and number.

By the end of Year 4, pupils should have **memorised their multiplication tables** up to and **including the 12 multiplication table** and show precision and fluency in their work.

Pupils should **read and spell mathematical vocabulary** correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

Questioning

Discussion

Team work

Sharing ideas

Exploring hands on

Collaborating

End of year expectations:

The areas covered in Year 4:

- Number and place value
- Addition and subtraction
- Multiplication and division (all times tables)
- Fractions and decimals
- Measurement: length and perimeter, area, money and time
- Property of shapes
- Position and direction
- Statistics

- count in multiples of 6, 7, 9, 25 and 1,000
- find 1,000 more or less than a given number
- count backwards through 0 to include negative numbers
- recognise the place value of each digit in a four-digit number (1,000s, 100s, 10s, and 1s)
- order and compare numbers beyond 1,000
- identify, represent and estimate numbers using different representations
- round any number to the nearest 10, 100 or 1,000
- solve number and practical problems that involve all of the above and with increasingly large positive numbers
- read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of 0 and place value
- add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
- estimate and use inverse operations to check answers to a calculation
- solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why
- recall multiplication and division facts for multiplication tables up to 12 × 12
- use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers
- recognise and use factor pairs and commutativity in mental calculations
- multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects
- recognise and show, using diagrams, families of common equivalent fractions
- count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10
- solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number
- add and subtract fractions with the same denominator
- recognise and write decimal equivalents of any number of tenths or hundreds
- recognise and write decimal equivalents to 1/4 , 1/2 , 3/4
- find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths
- round decimals with 1 decimal place to the nearest whole number
- compare numbers with the same number of decimal places up to 2 decimal places
- solve simple measure and money problems involving fractions and decimals to 2 decimal places

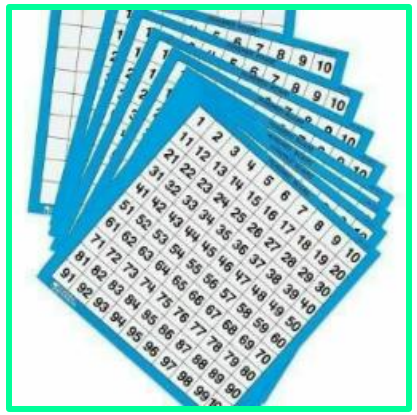
How is Maths taught at Barnsbury?

At Barnsbury we aim to provide children with mathematical experiences which stimulate their enthusiasm and develops their fluency, ability to reason mathematically and their capacity to solve problems.
Using the White Rose Maths approach, we plan our lessons using a Mastery approach, the idea is that children study a Mathematical concept in depth and 'master' it before moving on.

- Daily **1 hour** lesson.
- **RAP time** - Lessons start with a **brief review of previous learning** then move on to **more complex problems**, this is to **reduce the risk of gaps in learning**.
- **Practical exploration** of mathematical problems through a **concrete, pictorial** and **abstract approach**.
- Use of **sentence stems** to develop their **fluency** and **verbal reasoning skills.**
- RAP time – can be used within the lesson to **consolidate and extend children's learning**.
- Children are encouraged to **identify and apply maths** in other contexts.
- The children have the **same opportunities** but will move through **'challenges' at a different speed, with varying amounts of support**
- Children who **grasp concepts at a faster speed can move onto more complex problems quicker.**

A typical lesson: Learning practically at school (concrete)

Concrete is the **"doing" stage**. During this stage, students use concrete objects to model problems. Unlike traditional maths teaching methods where teachers demonstrate how to solve a problem, the CPA approach brings concepts to life by **allowing children to experience and handle physical (concrete) objects.**



100 square

Bead strings

Multi-link cubes

Two sided counters

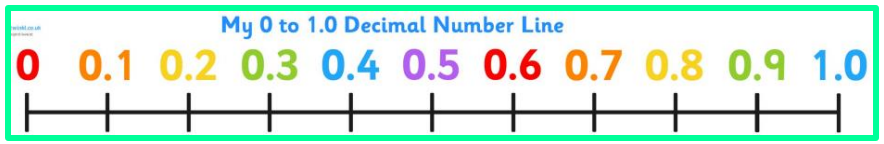
Dienes

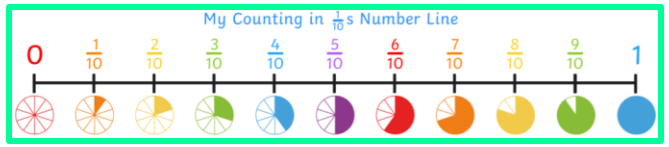
Cuisenaire rods

Place value cards

Numicon

Place value counters

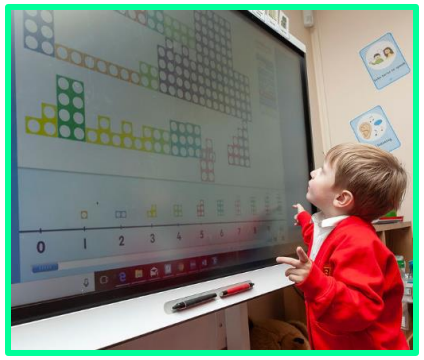




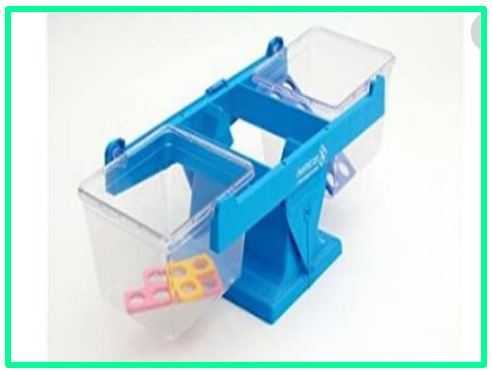
Number lines

A typical lesson: Learning practically at school with Numicon

As a Numicon advocate school learners from Nursery to Year 6 use the teaching resource **Numicon.** The Numicon approach is multi-sensory, using apparatus and focusing on Action, Imagery and Conversation.






The Numicon approach is **multi-sensory,** using apparatus and focusing on **Action, Imagery and Conversation.**

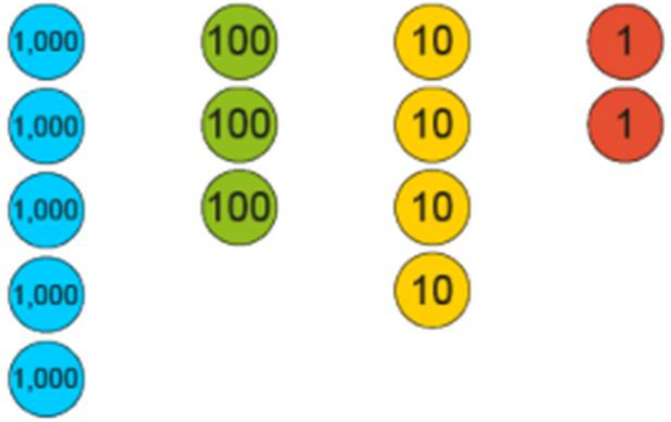
Numicon is an approach to teaching maths that **helps your child to see connections** between numbers. The program of activities helps students to **understand number relationships, spot patterns and make generalisations.** When Numicon patterns are arranged in order, pupils begin to notice important connections between numbers, for instance that each number is one more than the last and one fewer than the next, odd and even numbers and place value.

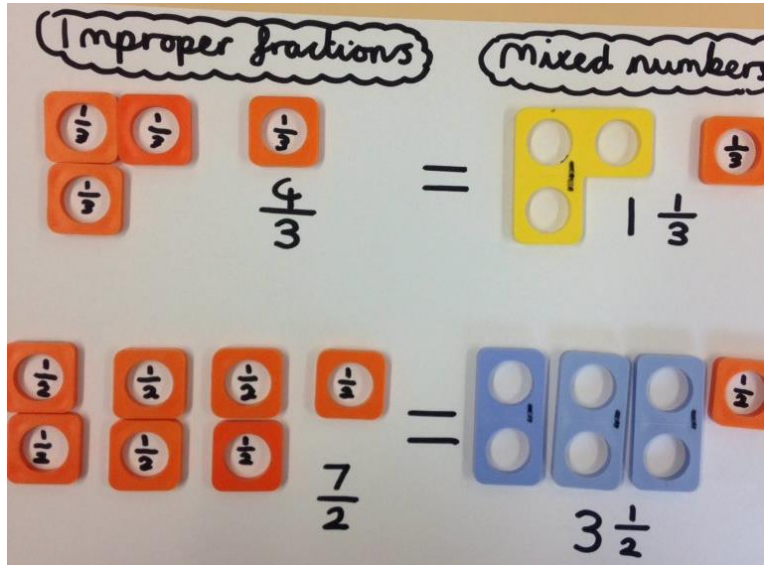
numicon advocate school

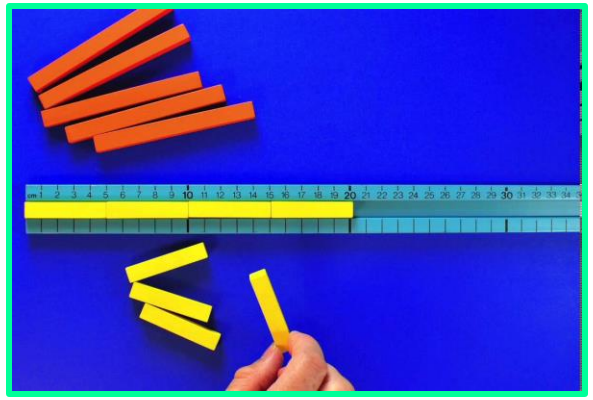
Year 4

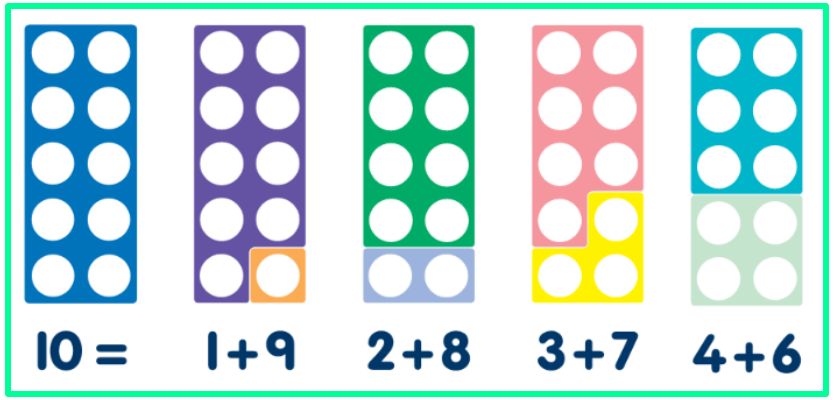
A typical lesson: Learning practically at school with Numicon

Numicon illustrates number bonds, addition and subtraction, place value, doubling and halving, estimation, division and multiplication. The Numicon Shapes and rods help teachers and students to communicate their ideas. **Students are encouraged to work together on activities which emphasise applying understanding to solve problems.**









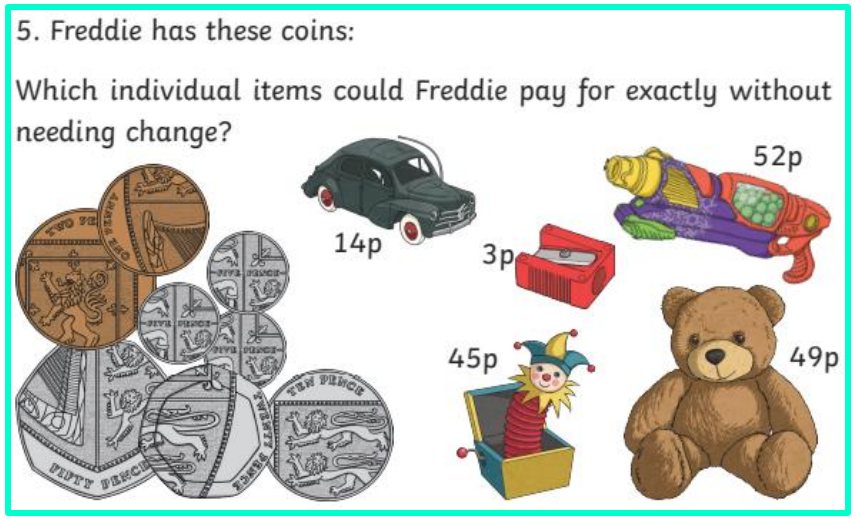
In Year 4 Numicon resources feature in all areas of the maths curriculum.

numicon advocate school

Year 4

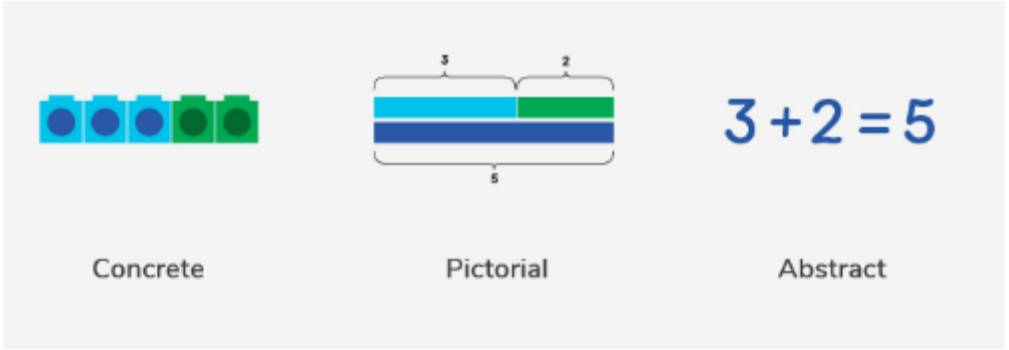
A typical lesson: Learning practically at school (pictorial)

The **'seeing'** stage. Visual **representations** of concrete objects are used to model problems. Children make a mental connection between the physical object they just handled and the abstract **pictures enabling them to reason and solve problems.**
Here is a simplified example of this approach being used for addition.

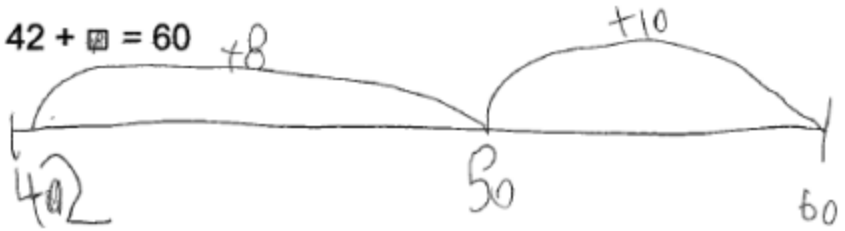


A typical lesson: Learning practically at school (abstract)

The **‘symbolic’** stage. Introducing abstract concepts for example, **mathematical symbols**. Using only numbers, notation, and mathematical symbols (for example, +, –, x,) to indicate addition, subtraction and multiplication.



$$\begin{array}{r} 9\ 3\ 6\ 9 \\ +\quad 4\ 1\ 5 \\ \hline \\ \hline \end{array}$$



$$\begin{array}{r} \square\ 6\ \square\ 8 \\ +\ 3\ \square\ 9\ \square \\ \hline 9\ 0\ 1\ 9 \end{array}$$

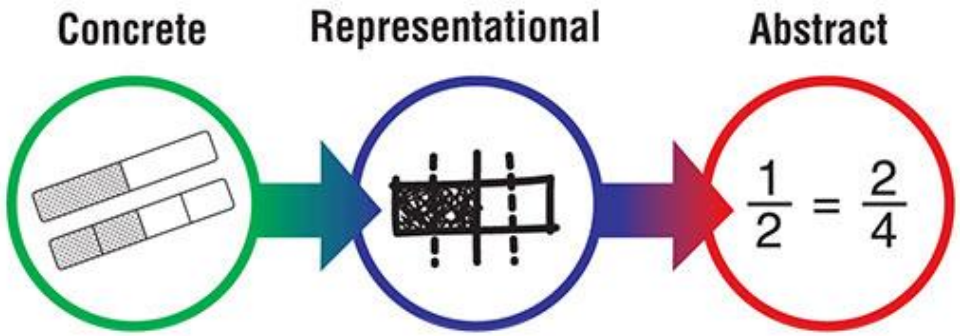
$8 \times 12 =$ _____

$10 \times 7 =$ _____

$6 \times 5 =$ _____

$4 \times 8 =$ _____

$10 \times 7 =$ _____

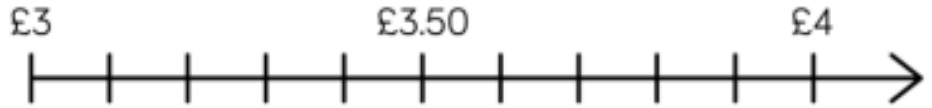


A typical lesson: Learning practically at school: Varied Fluency & Verbal Reasoning

Varied Fluency- Opportunities for practice help them reach an effortless stage of fluency where they can **apply** their knowledge to solve unfamiliar problems. Learners choose efficient strategies, recall facts and double check their answers. They understand that there are many ways to solve a problem.

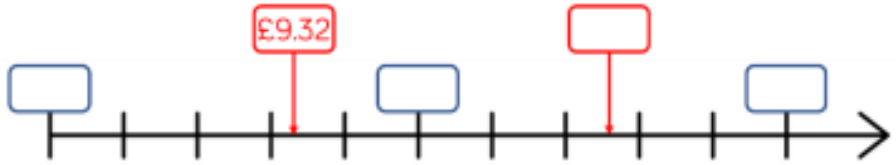
Place the amounts on the number line and round to the nearest pound.

- £3.67
- £3.21
- £3.87



- £7.54
- £7.45
- 701 p

Complete this number line.



Circle the largest angle in each shape or diagram.

Order the amounts in ascending order.

130 p	£0.32	132 p	£13.20

Order the amounts in descending order.

257 p	£2.50	2,057 p	£25.07

3a. Which decimal is shown on the place value grid?

Ones	tenths	hundredths
		

Write an equivalent fraction.

VF

I already know that ... so ...

I wonder whether ...

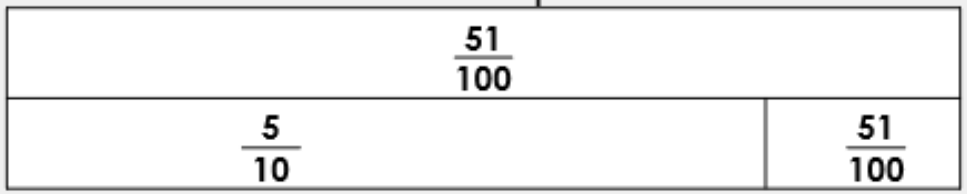
A typical lesson: Learning practically at school: Varied Fluency & Verbal Reasoning

I already know that ... so ...

Verbal reasoning- Opportunities for solving mathematical problems. Finding the solution, **justifying** their answer and giving proof.

The pattern I noticed was ...

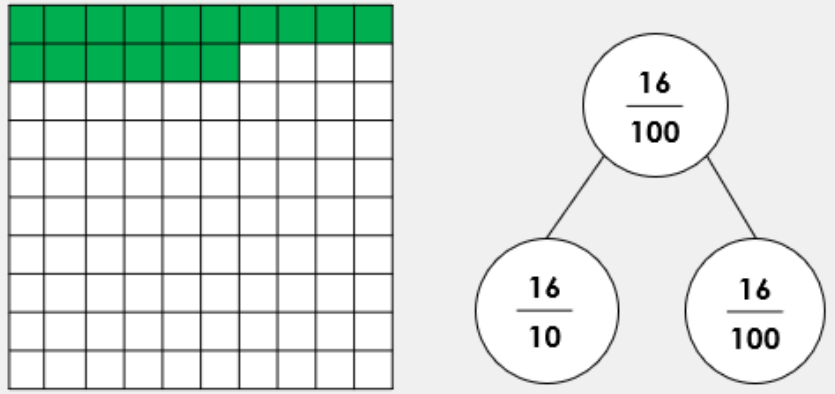
Freddie thinks he has completed the bar model.



Is he correct? Explain how you know.

Freddie is incorrect because he has partitioned the number into 5 tenths and 51 hundredths, rather than 5 tenths and 1 hundredth.

Jaxon has represented 16 hundredths in two different ways.



Is he correct? Explain your answer.

Jaxon is incorrect because the part whole model does not show the correct number of tenths or hundredths. It should say $\frac{1}{10}$, $\frac{6}{100}$ instead.

White Rose Maths:

EVERYONE CAN DO MATHS: EVERYONE CAN!

The **White Rose** curriculum is a cumulative curriculum so that once a topic is covered it is met many times again in other contexts.

Together, we're building a whole new culture of deep understanding, **confidence** and **competence** in maths – a culture that produces strong, secure learning and real progress.

We're shaping assured, happy and resilient mathematicians who relish the challenge of maths. They become **independent, reflective thinkers**, whose skills not only liberate them in maths but also support them **across the curriculum.**

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value				Number: Addition and Subtraction			Measurement: Length and Perimeter		Number: Multiplication and Division		
Spring	Number: Multiplication and Division			Measurement: Area	Number: Fractions				Number: Decimals			Consolidation
Summer	Number: Decimals		Measurement: Money		Measurement: Time		Statistics	Geometry: Properties of Shape		Geometry: Position and Direction		Consolidation

White Rose Maths

Year 4

White Rose Maths:

'All children can be successful with mathematics, provided that they have opportunities to **explore mathematical ideas in ways that make personal sense to them and opportunities to develop mathematical concepts and understanding.** Children need to know that practitioners are interested in their thinking, respect their ideas, are sensitive to their feelings and value their contributions.' DCSF (2008)

Divide by 100

Notes and Guidance

Children divide by 100 with whole number answers.

Money and measure is a good real-life context for this, as coins can be used for the concrete stage.

Mathematical Talk

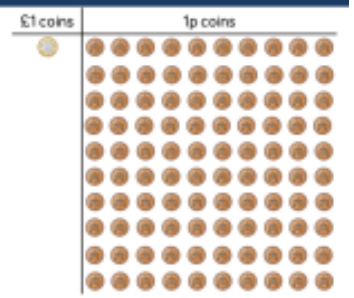
How can you use dividing by 10 to help you divide by 100?

How are multiplying and dividing by 100 related?

Write a multiplication and division fact family using 100 as one of the numbers.

Varied Fluency

- Is it possible for £1 to be shared equally between 100 people?
  How does this picture explain it?
  Can £2 be shared equally between 100 people?
  How much would each person receive?



- Match the calculation with the correct answer.

4,200 ÷ 10	420
4,200 ÷ 100	42
420 ÷ 10	

- Use <, > or = to make each statement correct.

3,600 ÷ 10	◯	3,600 ÷ 100
2,700 ÷ 100	◯	270 ÷ 10
4,200 ÷ 100	◯	430 ÷ 10

Times tables:

Why is it important for my child to know the times tables?

When children know their times tables, mental arithmetic becomes easier. Practising times tables also helps children to understand number and number relationships, and to see patterns in numbers. These skills will help them to master key concepts and move quickly through more complex maths problems with confidence- Oxford Owl.

The 12 Times Table with Chirpy Cockerel

Tottenham Hotspur mascot, Chirpy Cockerel has a song and movement routine to help students learn the 12 times table.

KS2 Maths: Multiples Mash-up March with Mr P

Join Mr P for a mash-up of the multiples of 3, 6, 7, 8 and 12 for Key Stage 2 pupils. See if your class can smash it with Mr P!

The Multiplication Tables Check

Starting in June 2019, the Multiplication check will be introduced to Year 4. The purpose of the MTC is to determine whether pupils can recall their times tables fluently, which is essential for future success in mathematics. It will help schools to identify pupils who have not yet mastered their times tables, so that additional support can be provided. It will test their knowledge of of times tables up to and including the 12 tines tables.

Songs (BBC super movers)

Games

The end of year expectation is for learners to know all of the times tables up to and including the 12 times tables.

Your child will have a TTRS login.

Growth mind-set and parental support:

Our children are active participants in their own learning. They are taught to develop skills of self-evaluation and understand the importance of taking responsibility for their own learning and for their actions.

At Barnsbury we: **Believe • Persevere • Succeed**

Fixed mind- Believing that intelligence cannot be changed in any meaningful way. People are naturally intelligent, it is fixed.

VS

Growth mind- Believing that intelligence can be developed over time. Through effort and determination, intelligence can grow.

Promoting a growth mind set at school and home:

‘But I am hopeless at maths’:

-If children hear ‘I can’t do maths’ from parents, family or friends they begin to believe it isn’t important. Don't tell them you are/were hopeless at maths. You were probably not hopeless, and even if you were, that implies to your child, **“I was hopeless at maths, and I'm a successful adult, therefore maths is not important”**

-Children who succeed at maths are usually the ones who **enjoy** it most, so remember – maths is fun, everyone! even if that’s not the way you remember it from your own childhood. We all know how easily children pick up on the things we say, so it’s **vital that you don’t pass on your dislike or fear of maths** by saying things like ‘I was never any good at maths’ or ‘I hated maths at school’ etc…-bbc

Growth mind set in 1, 2, 3...

1. View challenge positively
2. The power of yet ‘I can’t do ... YET!’
3. Mistakes are okay, in fact we value them! We can promote them as opportunities for growth, in class we might say ‘good mistake’.

How can I support my child at home?:

Maths is all around:

- Cooking/ baking- weighing, measuring, problem solving, double, half
- Shopping - counting, money, budgeting, delivery times/days, offers and deals
- Real life problems – planning garden projects, a meal or day out – ticket prices, travel costs,
- The school run- numbers in the world around us, numbers for a purpose on buses and road signs etc.
- Important dates- months, days of the week, 'sleeps until...'
- Songs - times tables
- Time in nature- counting objects at the beach/ woods.

What we are loving right now

2020 JUNE						
SUN	MON	TUE	WED	THU	FRI	SAT
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

www.free-printable-calendar.com

How can I support my child at home?:

Websites for information:

https://home.oxfordowl.co.uk/maths/

https://home.oxfordowl.co.uk/maths/numicon-guide-for-parents/

https://www.bbc.co.uk/bitesize/learn

https://www.bbc.co.uk/teach/supermovers/times-table-collection/z4vv6v4

Websites for learning
www.mathsisfun.com

www.nrich.maths.org

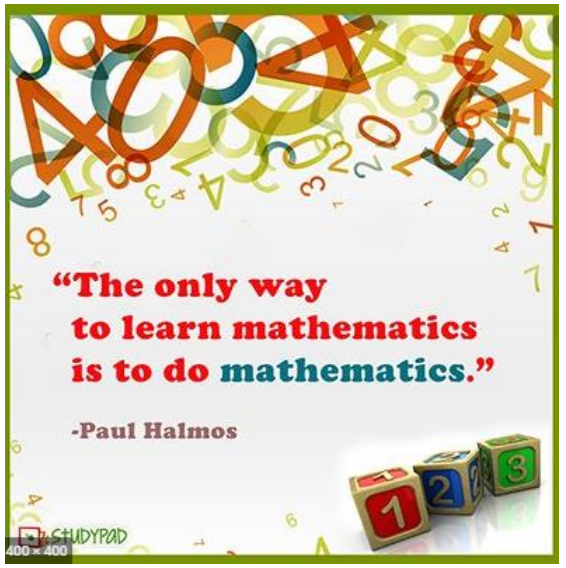
http://www.mathszone.co.uk

www.crickweb.co.uk

http://www.maths-games.org/times-tables-games.html

https://www.topmarks.co.uk/maths-games/7-11-years/ordering-and-sequencing-numbers

https://ttrockstars.com/



Your child is at the very beginning of their maths journey. While developing their understanding at this stage can be extremely valuable, try to make sure their learning does not become a chore, for you or for them.

It doesn't take a great deal of imagination or enthusiasm to turn any part of this early learning into a brief, playful experience. You will also likely find that a 'little-and-often' approach will pay off, and as your child's confidence as a mathematician grows, the more that they will want to engage with maths.

Third Space Learning

Please ask if you have any further questions.