



Maths at Barnsbury Primary School and Nursery

Year 3

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.**

Questioning

Discussion



Team work

Sharing ideas

Exploring hands on

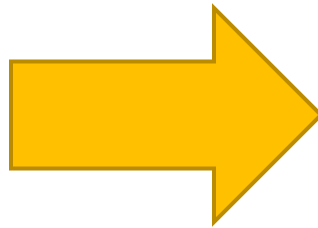
Collaborating



End of year expectations:

The areas covered in Year 3:

- Number, place value and rounding
- Addition and subtraction
- Multiplication and division (counting in 3's, 4's and 8's)
- Fractions
- Measures
- Geometry
- Data



- Compare & order numbers up to 1000
- Read & write all numbers to 1000 in digits and words
- Find 10 or 100 more/less than a given number
- Count from 0 in multiples of 4, 8, 50 and 100
- Recall & use multiplication & division facts for 3, 4, 8 tables
- Recognise place value of any 3-digit number
- Add and subtract: 3-digit numbers and ones 3-digit numbers and tens 3-digit numbers and hundreds
- Add and subtract: Numbers with up to 3-digits using written columnar method
- Estimate and use inverse to check
- Multiply: 2-digit by 1-digit
- Count up/down in tenths
- Compare and order fractions with same denominator
- Add and subtract fractions with same denominator within one whole
- Tell time using 12 and 24 hour clocks; and using Roman numerals
- Tell time to nearest minute
- Know number of days in each month and number of seconds in a minute



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**.
- Time for children 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



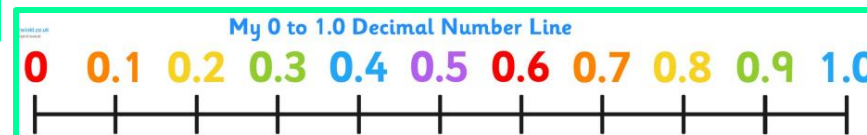
Place value cards



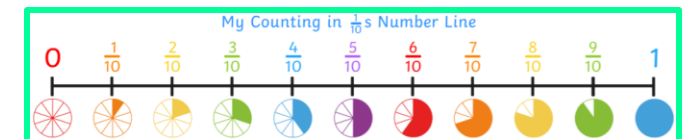
Numicon



Place value counters



Number lines

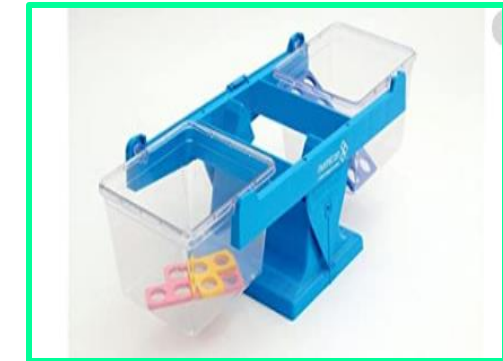
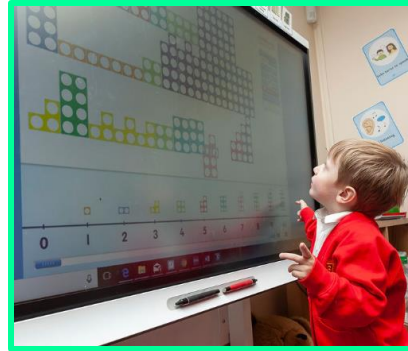


A typical lesson: Learning practically at school with Numicon

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.

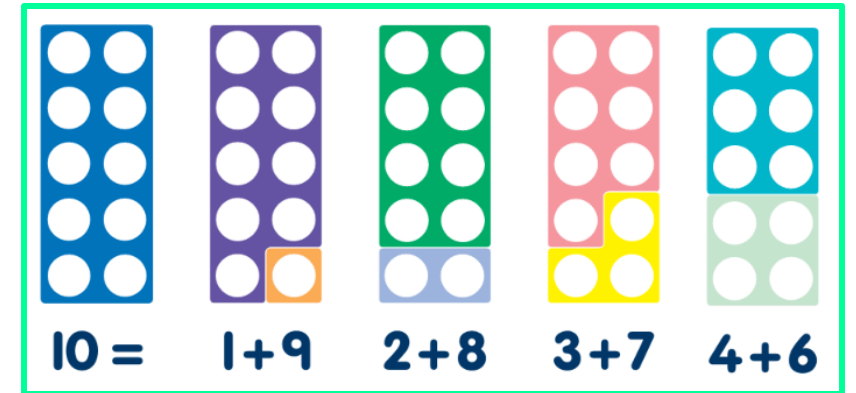
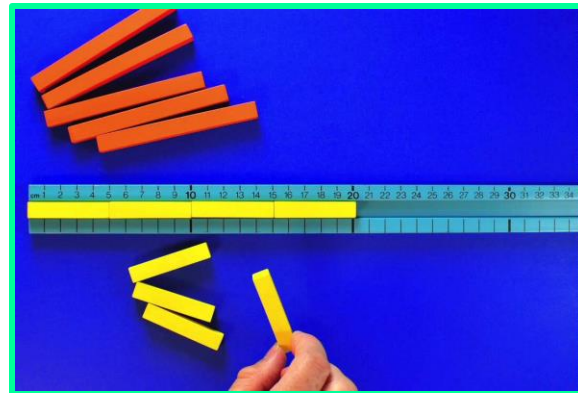
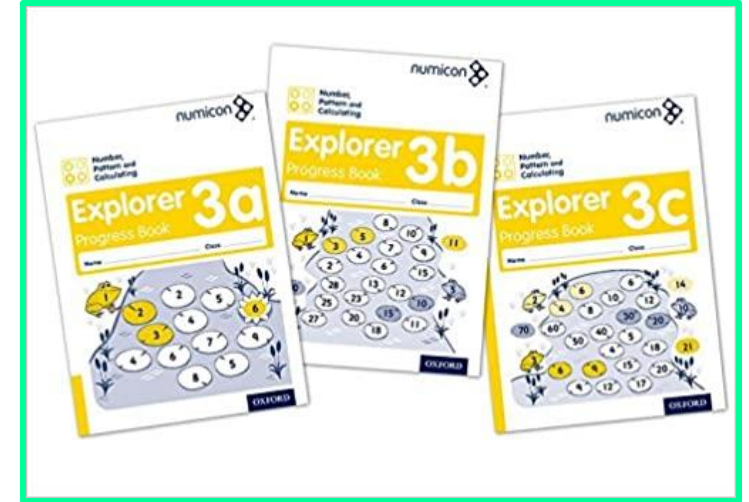
The Numicon approach is **multi-sensory**, using apparatus and focusing on **Action, Imagery and Conversation**.

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.



A typical lesson: Learning practically at school with Numicon

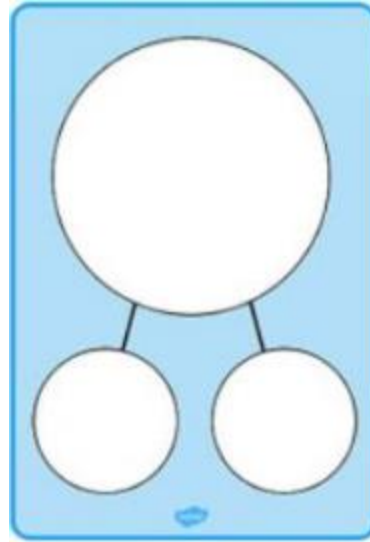
Numicon illustrates number bonds, addition and subtraction, place value, doubling and halving, estimation, division and multiplication. The Numicon Shapes and rods help teachers and students to communicate their ideas. **Students are encouraged to work together on activities which emphasise applying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



In Year 3 Numicon resources feature in all areas of the maths curriculum.

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**.

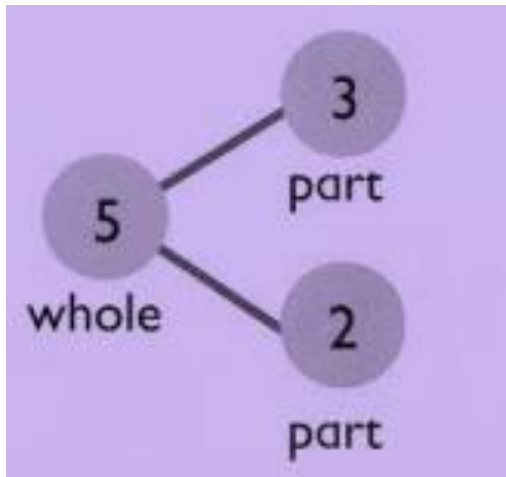


Tens	Ones
	••
2	3

Tens and ones/sticks and crosses



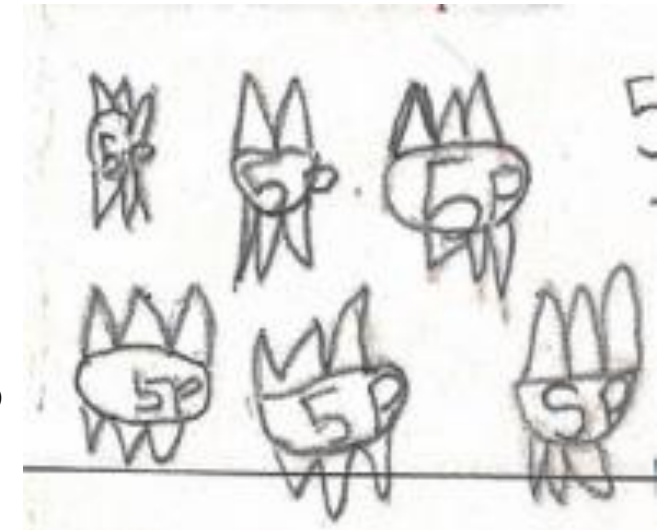
Bar/Part-whole model



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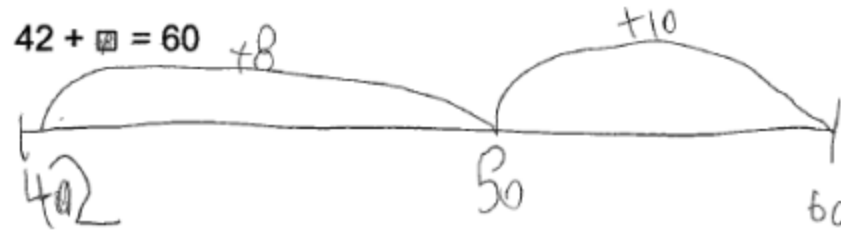


Drawing images to represent objects in a problem.



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.

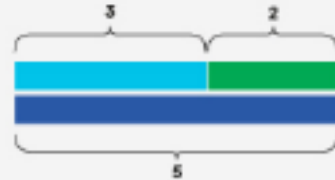


$$\begin{aligned} 10 - 4 &= 6 \\ 10 - 6 &= 4 \\ 4 + 16 &= 20 \\ 6 + 14 &= 20 \\ 20 - 6 &= 14 \\ 20 - 4 &= 16 \end{aligned}$$

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Concrete



Pictorial

$$3 + 2 = 5$$

Abstract

$$80 > 18$$



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.

Here is part of a bead string.



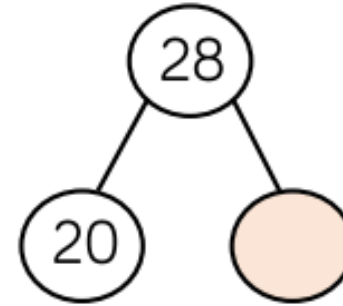
Complete the sentences.

There are _____ tens and _____ ones.

The number is _____.

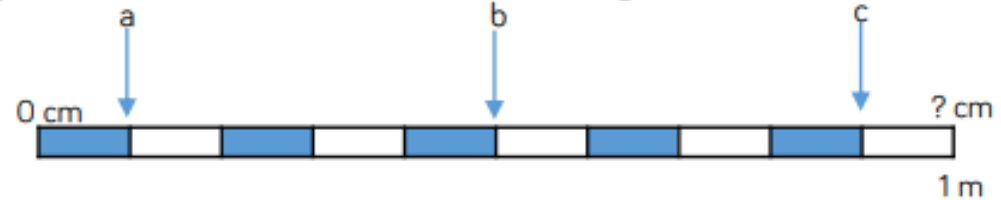
Represent 45 on a bead string and complete the same sentence stems.

Complete the part-whole model and write four number sentences to match.



$$\begin{array}{l} \underline{\quad} + \underline{\quad} = \underline{\quad} \\ \underline{\quad} + \underline{\quad} = \underline{\quad} \\ \underline{\quad} = \underline{\quad} + \underline{\quad} \\ \underline{\quad} = \underline{\quad} + \underline{\quad} \end{array}$$

If $a = 10$ cm, calculate the missing measurements.



$$b = \underline{\quad} \text{ cm}$$

$$c = \underline{\quad} \text{ cm}$$

$$1 \text{ metre} = \underline{\quad} \text{ cm}$$

I already know that ... so ...

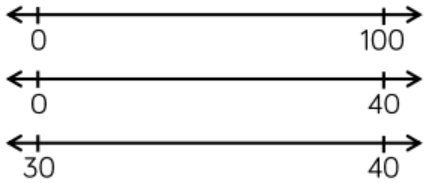
I wonder whether ...



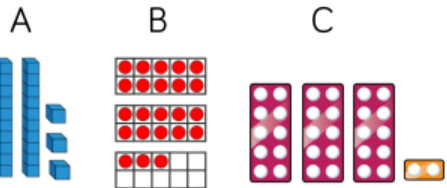
A typical lesson: Learning practically at school: Varied Fluency & Verbal Reasoning

I already know that ... so ...

Where would 36 go on each of the number lines?



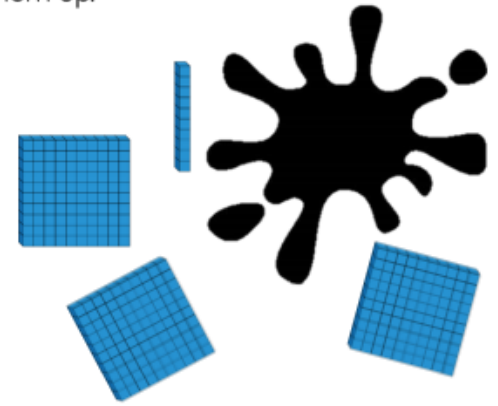
One of these images **does not** show 23. Can you explain the mistake?



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

The pattern I noticed was ...

Teddy has used Base 10 to represent the number 420. He has covered some of them up.



Work out the amount he has covered up.

How many different ways can you make the missing amount using Base 10?



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					Number: Multiplication and Division			Consolidation	
Spring	Number: Multiplication and Division		Measurement: Money	Statistics		Measurement: Length and Perimeter			Number: Fractions		Consolidation	
Summer	Number: Fractions		Measurement: Time			Geometry: Properties of Shape		Measurement: Mass and Capacity			Consolidation	

'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)

24-hour Clock

Notes and Guidance

Children are introduced to telling the time on a 24-hour digital clock for the first time.

Children spend time looking at analogue and digital clocks at various times throughout the day, in order to compare what is the same and what is different.

Mathematical Talk

Using the 12-hour clock, is the time an a.m. or a p.m. time?

What will the number representing the hour be in 24-hour clock time? How do you know if it will be less than 12 or more than 12?

What will the minutes be in 24-hour time? Where can you count from? When does the number of minutes become 0 again on a 24-hour clock display?

Varied Fluency

■ Create a diary using pictures to show your day from waking up to going to bed. Label these events using both 12-hour clock and 24-hour clock times.

■ Match the times to the clocks showing the same time.

9 o'clock in the morning



19:15

Half past 3 in the afternoon



09:00

Quarter past 7 in the evening



15:30

■ Complete the times.

13:45

Quarter to two in the _____

__:45

Quarter past three in the afternoon

11:20

Twenty past eleven in the _____

17:__

Twenty-five to six in the evening

15:50

Ten to four in the _____

__:__

Twenty to 9 in the morning

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 end of year expectation is for learners to be able to count in **3's 4's and 8's**. This is often taught through song and repetition.

At home:



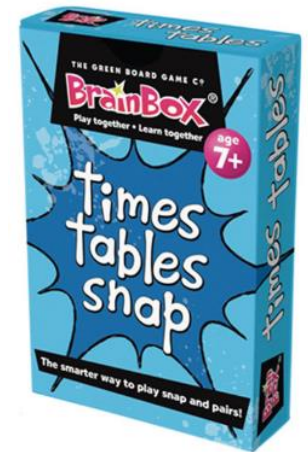
The 4 Times Table with Cyril the Swan

Let Cyril the Swan get your class moving and learning the 4 times table with this fun song and movement routine.

Songs (BBC super movers)



Your child will have a TTRS login. They can create their own rock star and compete in battles with other year groups.



Games



Number bonds: May need to check with Y3 – if they still do Number bonds??

Why is it important for my child to learn number bonds?

Knowledge of number bonds is essential when it comes to harder calculations involving addition and subtraction (for example, children learn to use the [bridging through 10 method](#) to help them add numbers mentally), so it is vital children get a firm grounding in this from Years 1 to 3.

The end of year expectation is for learners to be able to recall and use the number bonds to **10 and 20** (including subtraction)

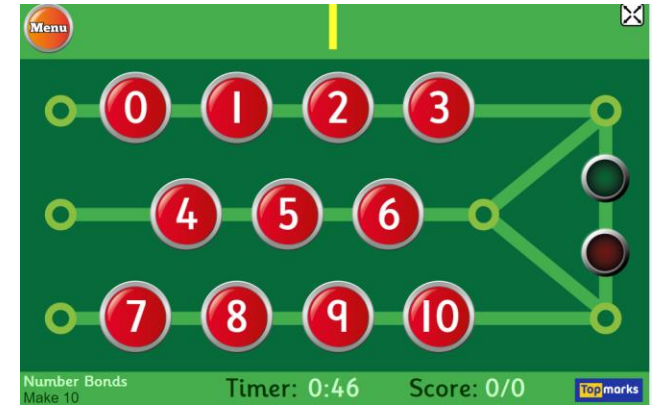
At home:



Practical problems



Your child will have a Numbots login.



Online games (Top Marks)

	$1 + 19$		$19 + 1$
	$2 + 18$		$18 + 2$
	$3 + 17$		$17 + 3$
	$4 + 16$		$16 + 4$
	$5 + 15$		$15 + 5$
	$6 + 14$		$14 + 6$
	$7 + 13$		$13 + 7$
	$8 + 12$		$12 + 8$
	$9 + 11$		$11 + 9$
	$10 + 10$		$10 + 10$

Charts and posters



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:

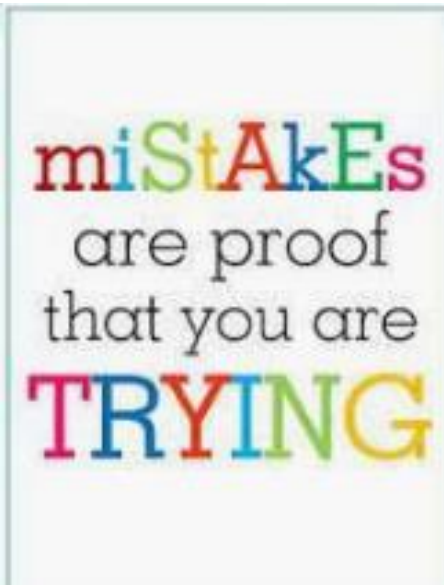
‘But I am hopeless at maths’:

-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.



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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/super movers/times-table-collection/z4vv6v4>

Websites for learning

www.mathsisfun.com

www.nrich.maths.org

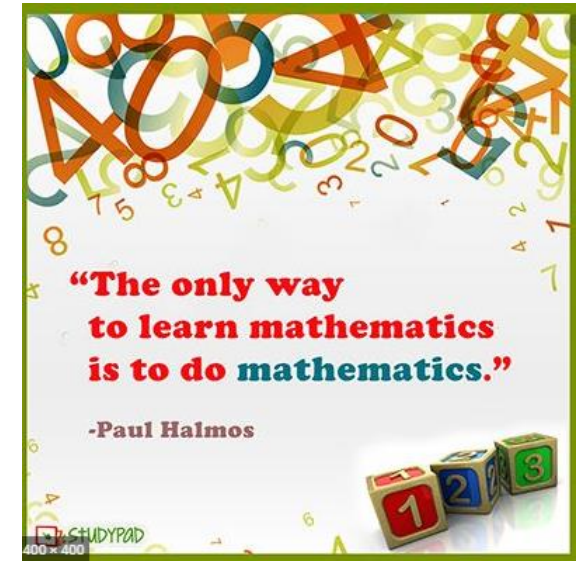
<http://www.mathszone.co.uk>

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.

