



Maths at Barnsbury Primary School and Nursery

Year 5

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 upper Key Stage 2 is to **ensure that pupils extend their understanding of the number system and place value to include larger integers**. This should **develop the connections** that pupils make **between multiplication and division with fractions, decimals, percentages and ratio**.

At this stage, pupils should **develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation**. With this foundation in arithmetic, pupils are introduced to **the language of algebra** as a means for **solving a variety of problems**. Teaching in **geometry and measures** should **consolidate and extend knowledge developed in number**. Teaching should also ensure that **pupils classify shapes with increasingly complex geometric properties** and that they **learn the vocabulary** they need to describe them.

Questioning

Discussion



Team work

Sharing ideas

Exploring hands on

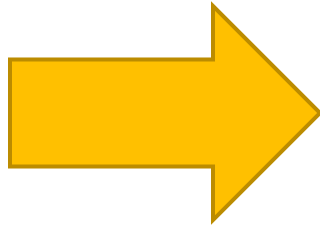
Collaborating



End of year expectations:

The areas covered in Year 5:

- 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



Check End of Year expectations

- Read, write, order and compare numbers to at least 1000000 and determine the value of each digit.
- Interpret negative numbers in context.
- Count forwards and backwards with positive and negative whole numbers including through zero.
- Add and subtract whole numbers with more than four digits, including using formal written methods.
- Add and subtract numbers mentally with increasingly large numbers (e.g. $12462 - 2300 = 10162$).
- Solve problems involving numbers up to three decimal places.
- Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.
- Multiply numbers up to four digits by a 1 or 2-digit number using a formal written method, including long multiplication for 2-digit numbers.
- Multiply and divide numbers mentally drawing upon known facts.
- Divide numbers up to four digits by a 1-digit number using the formal written method of short division and interpret remainders appropriately for the context.
- Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.
- Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3).
- Solve problems involving multiplication and division.
- Compare and order fractions whose denominators are multiples of the same number.
- Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.
- Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number
- Add and subtract fractions with the same denominator and denominators that are multiples of the same number.
- Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.
- Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred'.
- Write percentages as a fraction with denominator 100, and as a decimal.
- Read and write decimal numbers as fractions [e.g. $0.71 = 71/100$].
- Solve problems which require knowing percentage and decimal equivalents of $1/2$, $1/4$, $1/5$, $2/5$, $4/5$ and those fractions with a denominator of a multiple of 10 or 25.
- Read, write, order and compare numbers with up to three decimal places.
- Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.
- Round decimals with two decimal places to the nearest whole number and to one decimal place.
- Solve problems involving number up to three decimal places.
- Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.
- Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.



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



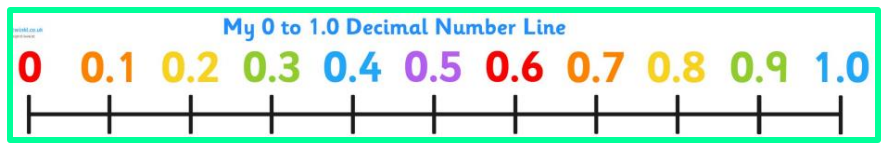
Place value cards



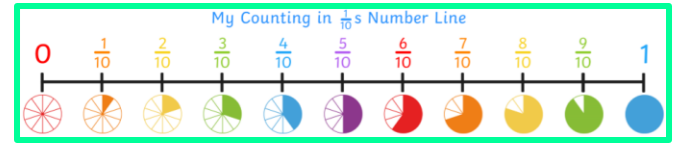
Numicon



Place value counters



Number lines

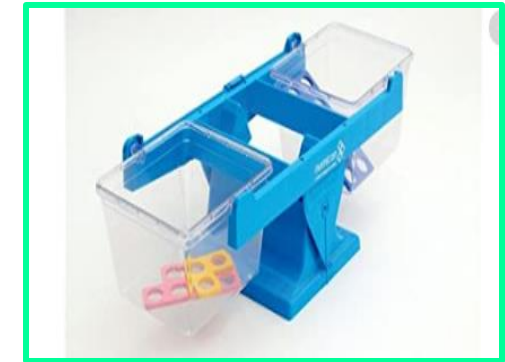


A typical lesson: Learning practically at school with Numicon

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.

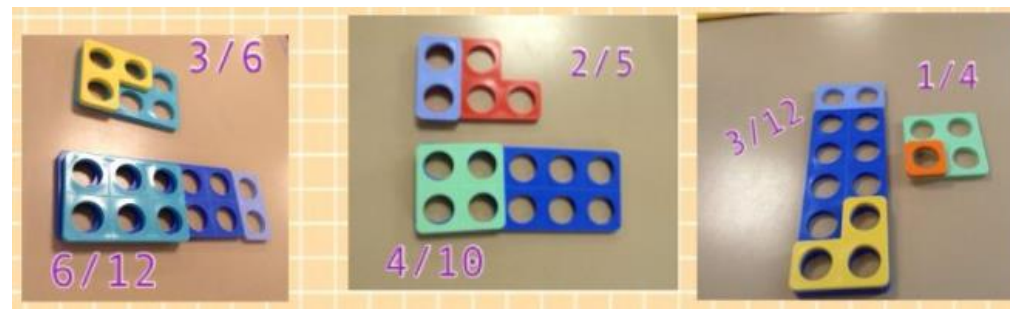
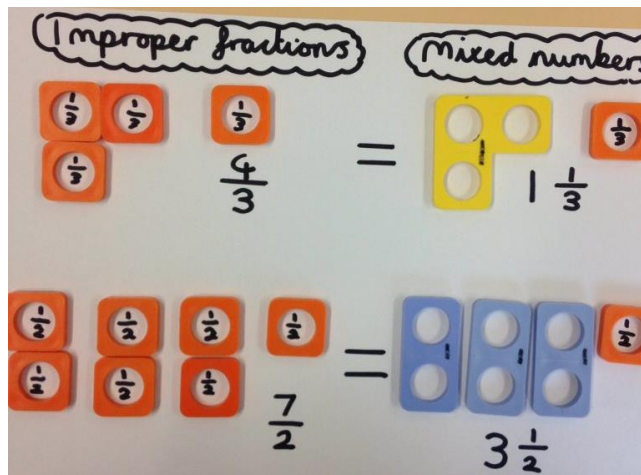
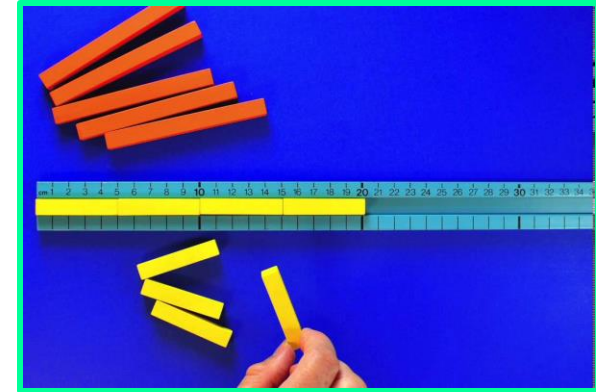
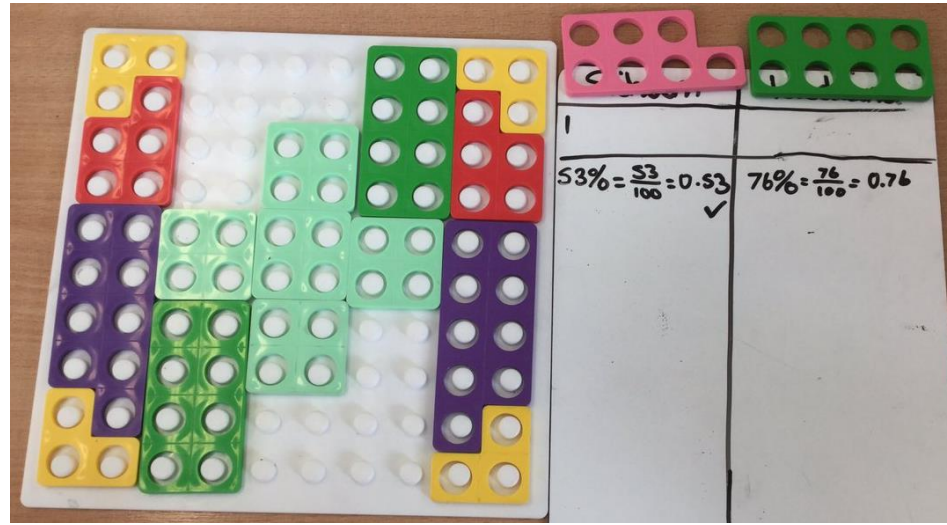
The Numicon approach is **multi-sensory**, using apparatus and focusing on **Action, Imagery and Conversation**.

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.

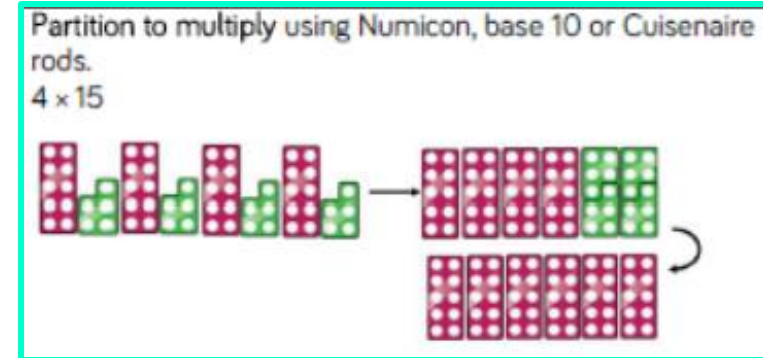


A typical lesson: Learning practically at school with Numicon

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.**



Equivalent fractions



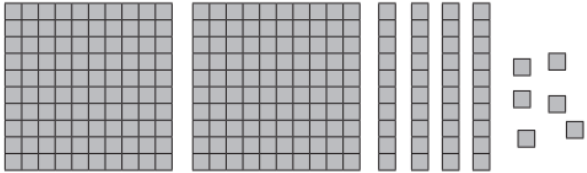
In Year 5 Numicon resources feature in all areas of the maths curriculum.

A typical lesson: Learning practically at school (pictorial)

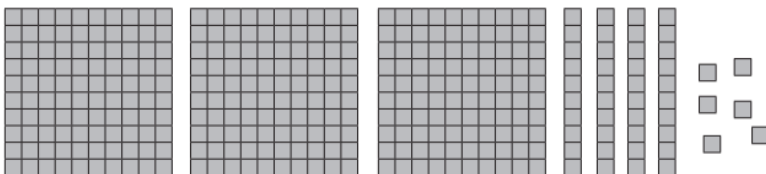
The **'seeing'** stage. Visual **representations** of concrete objects are used to model problems. Children make a mental connection between the physical object they just handled and the abstract **pictures enabling them to reason and solve problems.**

Here is a simplified example of this approach being used for addition.

Sarah's number



Max's number



What is Sarah's number?



Lilly has £5

She uses these coins to buy her lunch.



How much money does Lilly have left?

Formal column method with place value counters
(base 10 can also be used.) 3×23

10s	1s
	
6	9

Children to represent the counters pictorially.

10s	1s
00	000
00	000
00	000
6	9



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.

These Roman Numerals have a total of 10



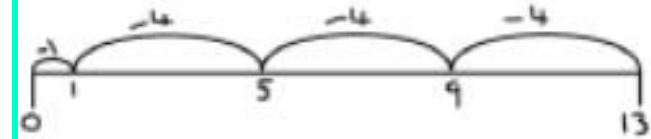
Write two Roman Numerals that have a total of 20



$13 \div 4 = 3$ remainder 1

Children should be encouraged to use their times table facts; they could also represent repeated addition on a number line.

'3 groups of 4, with 1 left over'



$$35 \times \boxed{} = 3,500$$

$$6 \times 7 \times 4 =$$

$$\begin{array}{r} 28\boxed{}65 \\ - 159\boxed{}2 \\ \hline 1\boxed{}403 \end{array}$$

Use the digits 3, 4 and 5 to complete the decimal number.



List all the possible numbers you can make.

Write these decimals as mixed numbers.

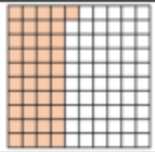

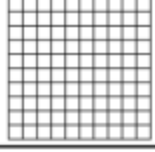
Choose three of the numbers and write them in words.



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.

Complete the table.

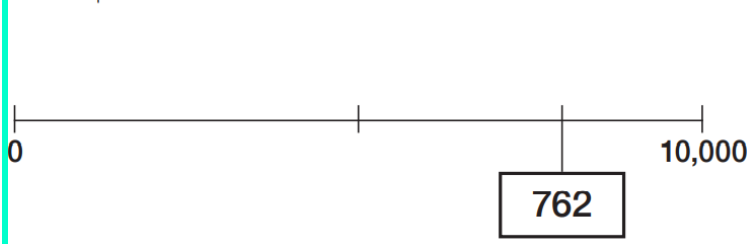
Pictorial	Percentage	Fraction	Decimal
	41 parts per hundred 41%	41 out of 100 $\frac{41}{100}$	41 hundredths 0.41
			
	7 parts per hundred 7%		

I used the inverse of ...



It must be ... because ...

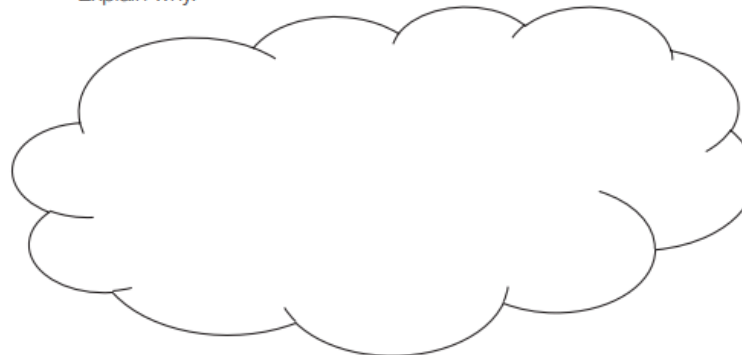
Tom places 762 on the number line.



Is Tom correct?

Yes No

Explain why.



Use a bead string to show me:

0.25 0.3 0.2 0.5

What are these decimals as a percentage?

What are they as a fraction? Can you simplify the fraction?

I checked by ...



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.

Rosie thinks the 2 values are equal.

Do you agree?
Explain your thinking.

Can you write this amount as a decimal and as a fraction?

Which of the images below is the odd one out?

A

B

C

D

Explain why.

In this problem symbols have been used to represent two different numbers. Write down the value of each, as a mixed number and as a decimal.

= 1
 = $\frac{1}{10}$
 = $\frac{1}{100}$
 = $\frac{1}{1000}$



White Rose Maths:

EVERYONE CAN DO MATHS:

EVERYONE CAN!

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**.

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



	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		Statistics		Number: Multiplication and Division			Measurement: Perimeter and Area		
Spring	Number: Multiplication and Division			Number: Fractions						Number: Decimals and Percentages		Consolidation
Summer	Consolidation	Number: Decimals			Geometry: Properties of Shape		Geometry: Position and Direction		Measurement: Converting Units		Measurement: Volume	



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)

Decimals as Fractions (2)

Notes and Guidance

Children concentrate on more complex decimals numbers (e.g. 0.96, 0.03, 0.27) and numbers greater than 1 (e.g. 1.2, 2.7, 4.01).

They represent them as fractions and as decimals.

Children record the number in multiple representations, including expanded form and in words.

Mathematical Talk

In the number 1.34 what does the 1 represent, what does the 3 represent, what does the 4 represent?

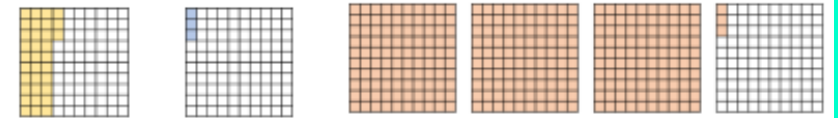
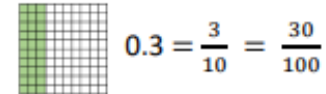
Can we represent this number in a different way, and another, and another?

On the number line, where can we see tenths? Where can we see hundredths?

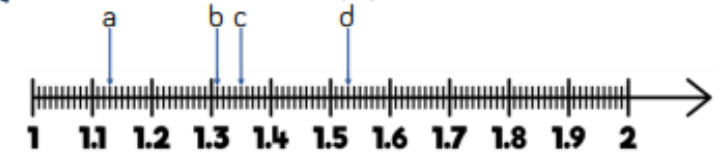
On the number line, tell me another number that is between c and d. Now give your answer as a fraction. Tell me a number that is not between c and d.

Varied Fluency

Use the models to record equivalent decimals and fractions.



Write down the value of a, b, c and d as a decimal and a fraction.



Complete the table.

Concrete	Decimal	Decimal - expanded form	Fraction	Fraction - expanded form	In words
	3.24	$3 + 0.2 + 0.04$	$3\frac{24}{100}$	$3 + \frac{2}{10} + \frac{4}{100}$	Three ones, two tenths and four hundredths.
	3.01		$3\frac{1}{100}$		
				$3 + \frac{4}{10} + \frac{2}{100}$	
					Two ones, three tenths and two hundredths.

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 know all of the times tables up to and including the 12 times tables.



Your child will have a TTRS login.



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!

Songs (BBC super movers)



Games



Year 5



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,
- Planning a family holiday or important event – planning budgets, seating plans, time tables
- 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/cbeebies/grownups/help-your-child-with-maths>

<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

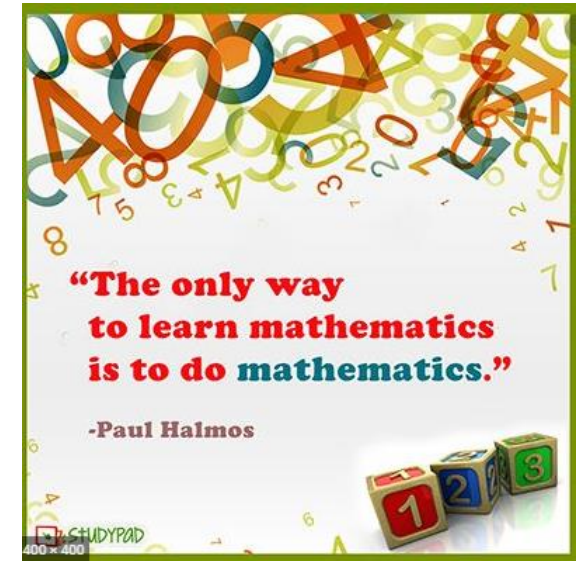
<http://www.mathszone.co.uk>

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.

