

‘ PLEASE, PLEASE... NEVER say that you are bad at maths ... not anywhere within a 100-mile radius of any child you ever want to influence.’

Session Aims

- What is fluency and how can we develop it?
- What does maths look like in EYFS and KS1?
- What is reasoning?
- How can children be supported at home?

What is fluency in maths?

Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics.

How do you know when a learner is fluent?

You can identify a fluent learner when they have a *secure understanding of what they're doing and why they're doing it.*

Researcher Dr Susan Jo Russell thinks fluency is made up of three key parts:

- **Efficiency:** learners choose efficient strategies and don't get bogged down in too many steps
- **Accuracy:** learners are accurate in their workings, have great recall of facts and double check their answers
- **Flexibility:** learners understand that there are many ways to solve a problem

Three stages of fluency

1. Simple strategies

Initially, as a child gets to grips with a new skill, they can work out an answer using concrete resources or counting strategies. This will probably help them solve a problem accurately, but it's not the most efficient strategy.

2. Mental calculations

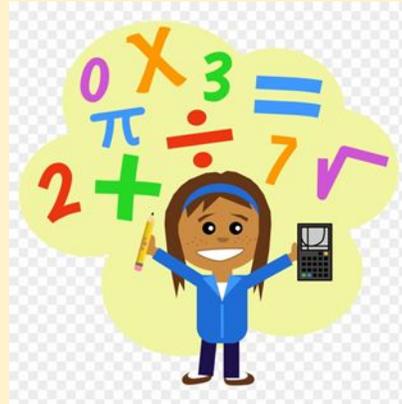
As learners become more proficient with new learning, they reach the second stage of fluency. Learners at this stage can work out an answer in their head. It still requires some thinking and effort as they develop reasoning strategies, but they're well on their way to becoming more efficient.

3. Achieving fluency

Finally, children reach the stage of 'I just knew it'. They can reliably produce accurate answers in an efficient way. This stage often involves using their knowledge flexibly; making connections so that the known can be used to work out the unknown.

In the words of Mark McCourt, ***"we consider someone to be fluent in a technique, procedure, idea, concept or fact at the point at which they no longer need to give attention"***.

How do we achieve fluency at Grange Park?



Our curriculum is based on the national curriculum using White Rose Maths and other materials that support the delivery of the curriculum.

White Rose allows children to be exposed to a variety of different types of learning and to ensure coverage of fluency, problem solving and reasoning in different formats to ensure that our maths curriculum is rich and varied.

Key areas to help achieve fluency

Tips:

- Subitising
- Number bonds 10, 20, 100
- Secure understanding of place value
- Times tables and related division facts
- Ability to perform the four operations

Subitising

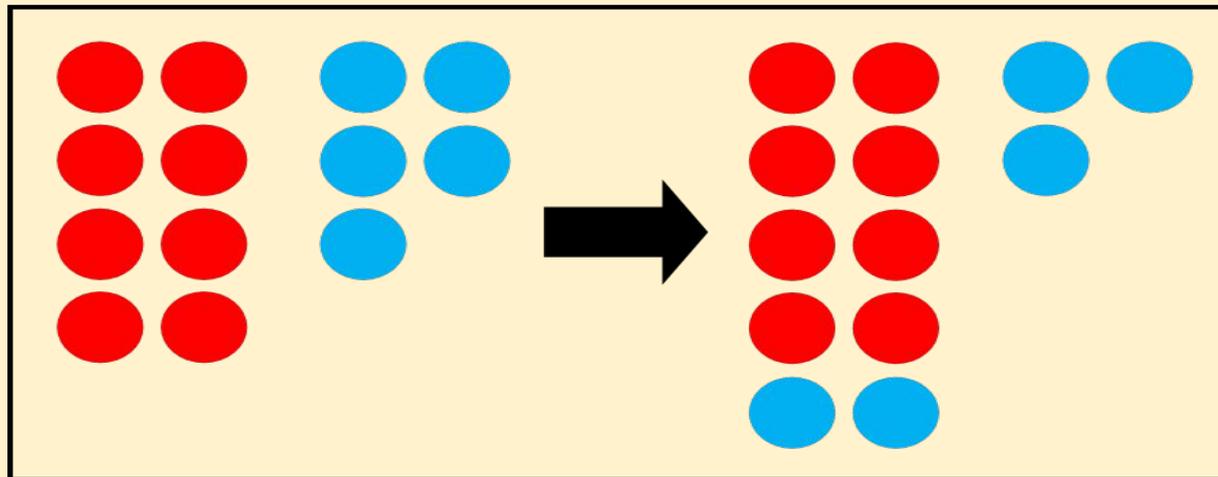
The process of immediately knowing how many objects are in a small group without needing to count them.



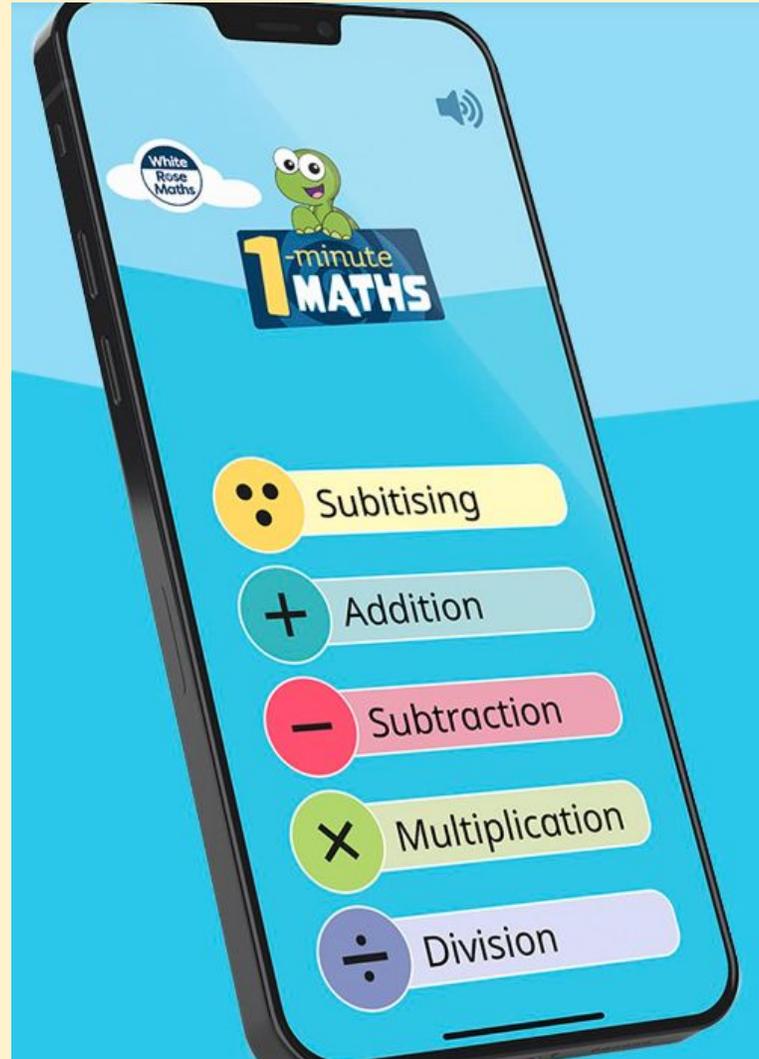
Subitising

Perceptual subitizing is instantly knowing how many are in a given set of 5 or less items.

Conceptual subitizing is the ability to see sets of numbers within larger sets



One-minute maths



Alternatives to maths resources

Counters



or you could use.....

Smarties



3D shapes



or you could use.....

groceries

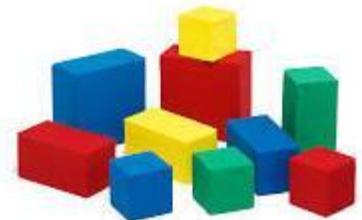


Counting Bears



or you could use.....

anything you have a lot of!



You can use anything you have around the house

Pasta for counting



Cards for number recognition and counting



Chewits for counting and addition/subtraction



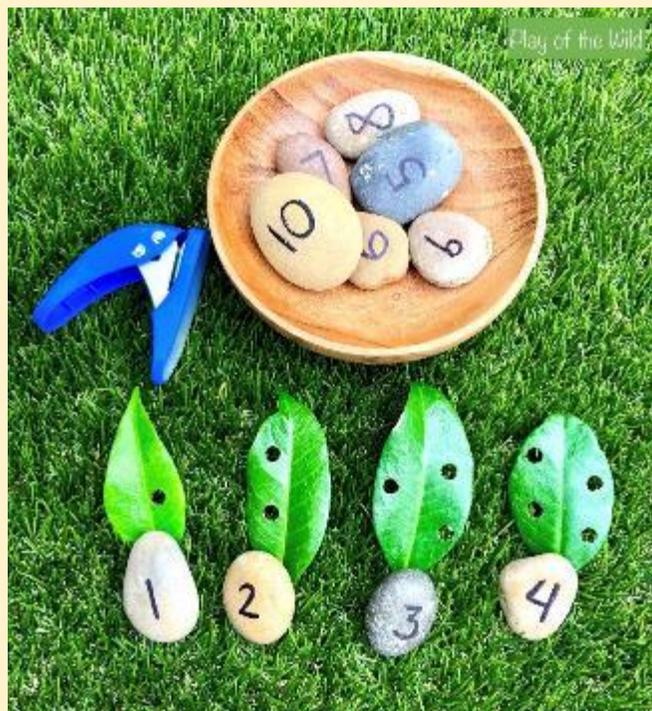
Toys to put in size order



Magnetic numbers for number recognition



Don't Forget Outside



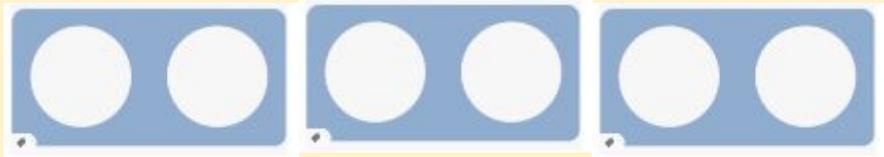


Numbers are all around us!



Counting in 2s and 10s

Numicon



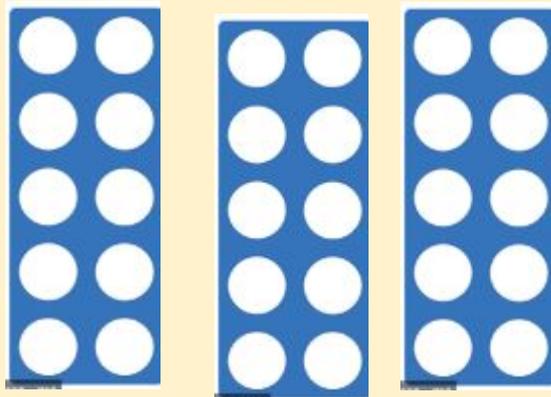
or you could use.....



socks



Numicon



or you could use.....



gloves

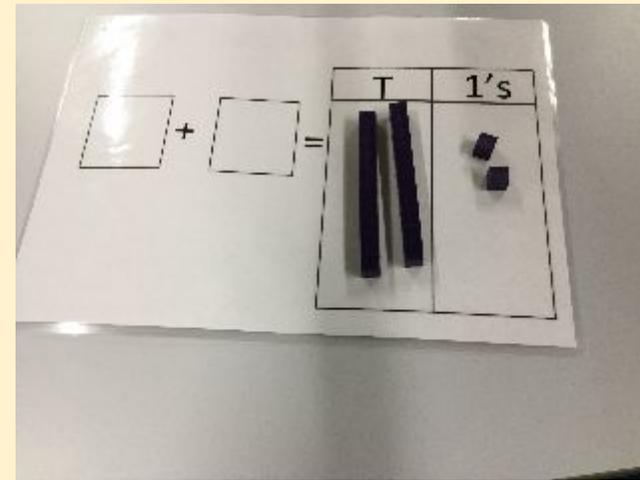
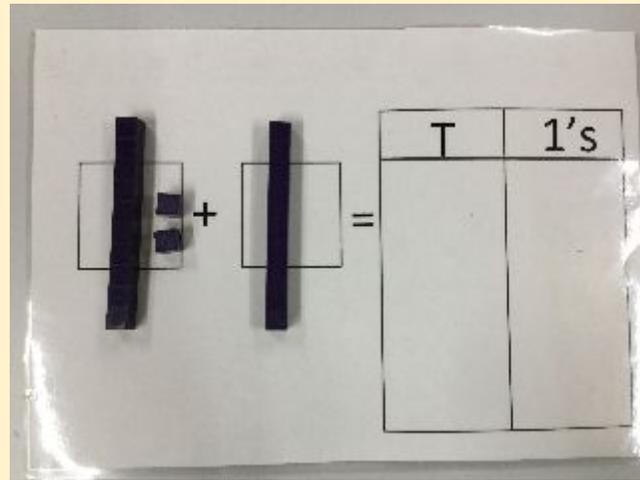
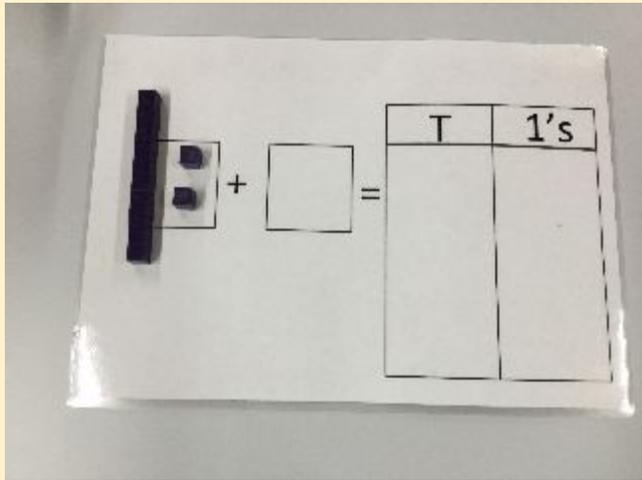
Addition/ Subtraction using sweets instead of dienes



In Year 2 we use dienes for addition/ subtraction. Instead of tens and ones resource you could use sweets (such as Chewits). A whole pack of Chewits are the tens and individual Chewits are the ones. E.g. $18 = 1$ tens and 8 ones

An example of an addition word problem being solved using dienes. This could be solved using sweets (e.g. Chewits)

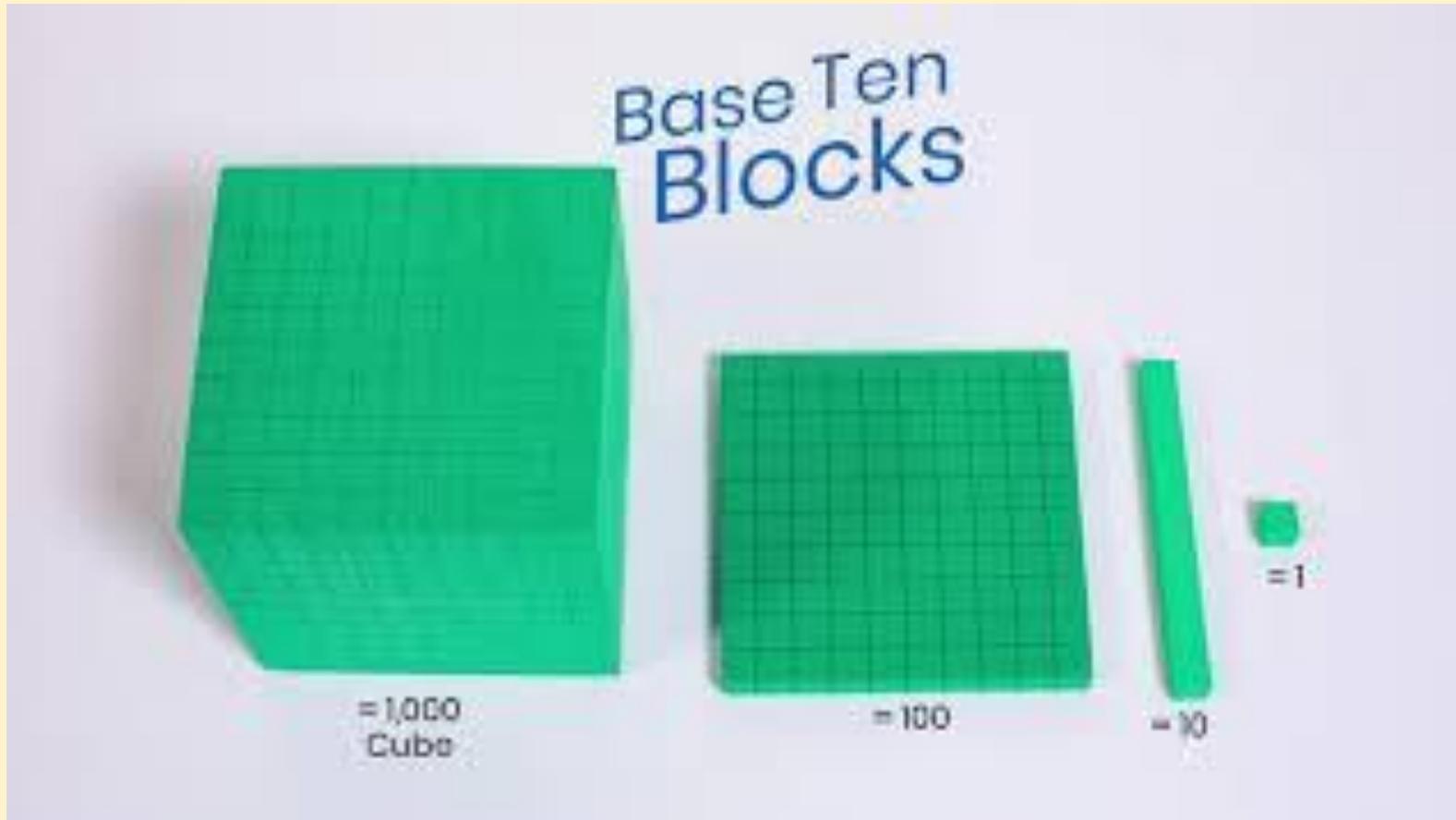
Big skeleton goes to the shop to buy cakes. He buys 12 chocolate cakes and 10 cream cakes. How many does he buy altogether?



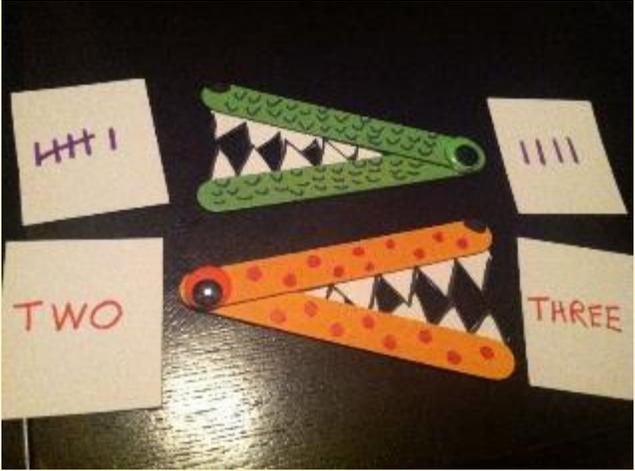
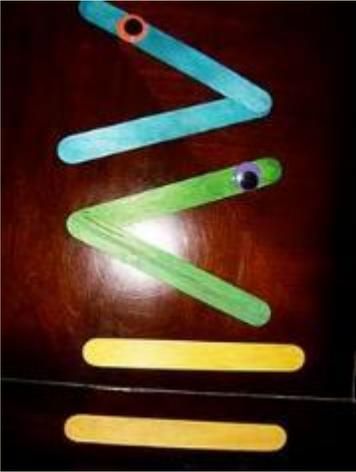
You could also use sticks as tens and stones as ones.



Base 10 (Dienes)



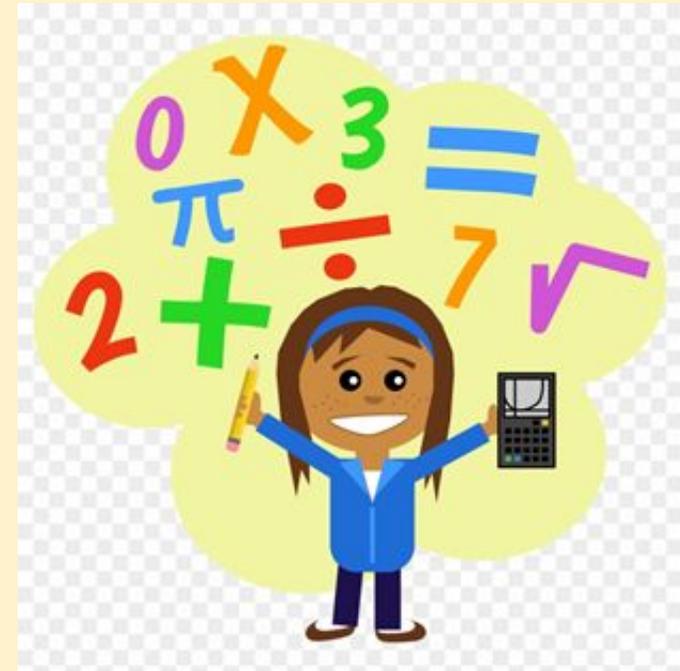
For greater or less than you could use...



For money work or problems you could use your own coins/ notes.



What does maths learning look like in EYFS and KS1?



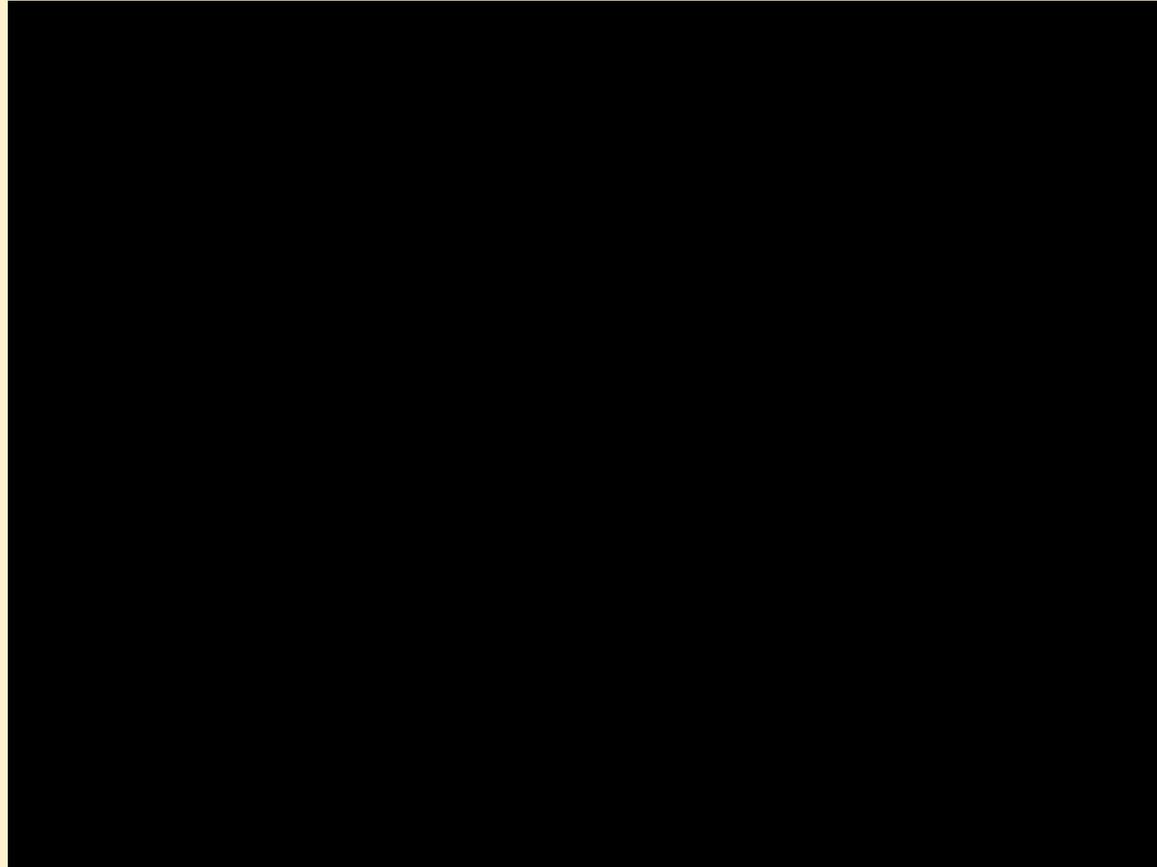
What does maths look like in EYFS?

Learning through play.

Outdoor activities.

Counting, counting and more counting!

Pattern spotting



Number recognition and ordering to 10.

Learning numbers bond up to 10.

Shape recognition, 2D and 3D.

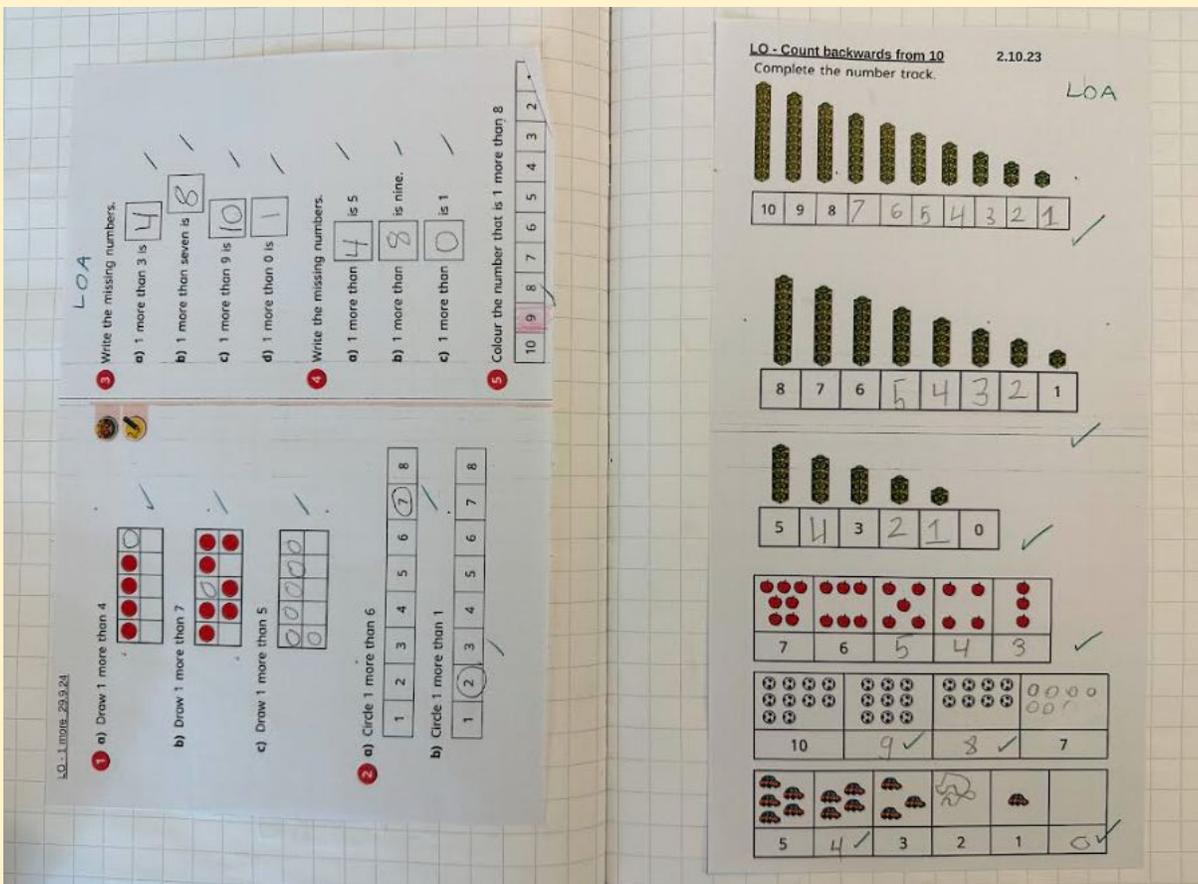
Addition and subtraction using single digit numbers.

What does maths look like in Year 1?

Number bonds to 10 and within 10.

To read time to O'clock and Half Past.

Count forwards and backwards in multiples of 2, 5 and 10.



Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers.

To double numbers to 10.

Read, write and interpret equations containing +, - and = symbols.

Count within 100, forwards and backwards, starting with any number.

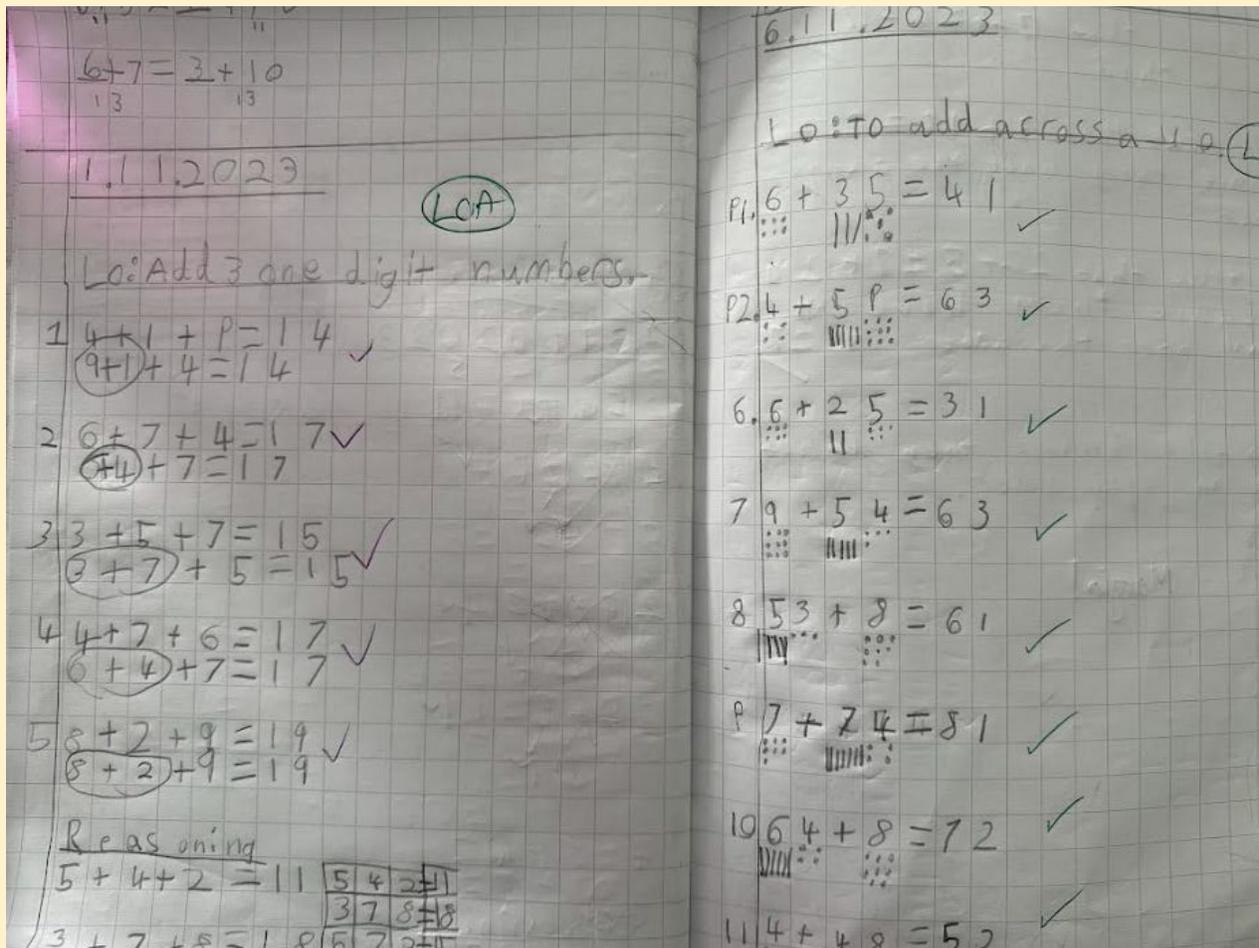
Recognise common 2D and 3D shapes presented in different orientations, and know that rectangles, triangles, cuboids and pyramids are not always similar to one another.

What does maths look like in Year 2?

Add and subtract within 100 by applying one-digit addition and subtraction facts. To add and subtract any 2 two-digit numbers.

To read the time to the nearest five minutes

To describe the properties of 2D and 3D shapes and compare shapes by their properties



Practical learning using a variety of resources.

Count in 2's, 3's, 5's and 10's from any number forward and backward

Recognise the place value of each digit in two-digit numbers.

Recognise the subtraction structure of 'difference' and answer questions such as "How many more...?".

Secure fluency in addition and subtraction facts within 10.

Key changes from EYFSA/Y1 to Y2

- Moving away from concrete resources
- Using pictorial representations
- Awareness and use of some abstract techniques
- Applying their knowledge of place value within 100 to add and subtract

It is quite a step up!

Calculation Policy

Our calculation policy is in line with the programmes of study taken from the National Curriculum for Mathematics (2014). It is designed to be challenging, focussing on essential core subject knowledge and skills. This document guides you through the appropriate calculation methods within each year group and the progression of skills throughout the school.

The content of this document is set out in year group blocks under the following headings: addition, subtraction, multiplication and division.

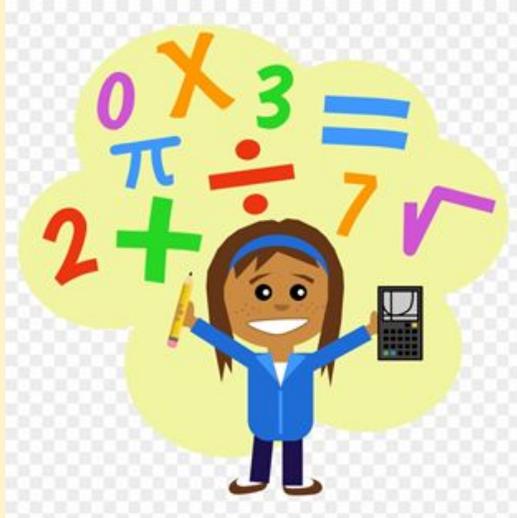
[Calculation Policy - Addition and Subtraction](#)

[Calculation Policy - Multiplication and Division](#)

Reasoning

...the action of thinking about something in a logical, sensible way

Progression in reasoning



Describing

Simply tells what they did

Explaining

Offers some reasons for what they did (may or may not be correct)

Convincing

Confident that their chain for reasoning is right (inductive reasoning)

Justifying

A correct logical argument that has a complete chain of reasoning

Proving

A watertight argument that is mathematically sound (deductive reasoning)

240

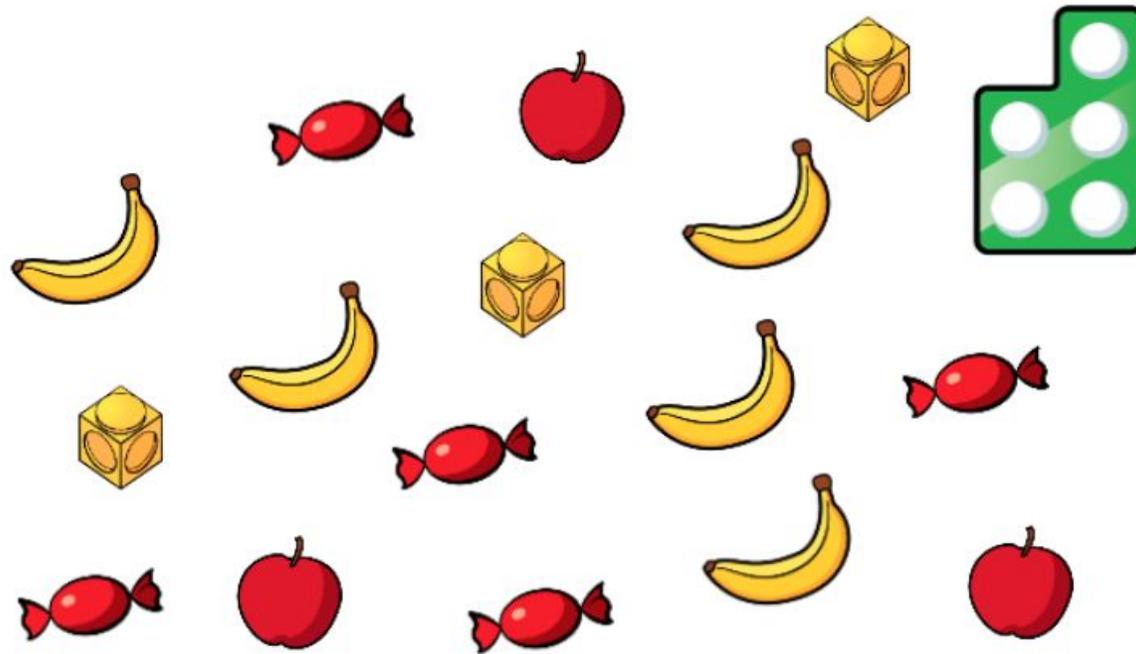
42

60

45

- All of the numbers...
- Some of the numbers...
- None of the numbers...

How many different ways can the objects be grouped?



Is the statement true or false?

1 ten and 12 ones is
greater than 2 tens.

How do you know?

Reasoning - key takeaways

- Ask children to explain how they answered the question
- Is there another way?
- Show a mistake and ask your child to explain what went wrong
- Insist on the use of the correct vocabulary
- Relate to real life situations

How can you help your child with maths at home?

- Take away their fear.
- Ask them how they would answer the question, not impart our own strategies to begin with.
- Reassure and praise whenever possible. Positive mindset...
- Let them see you using maths in your everyday routines - portioning meals between the family, chopping vegetables into halves and quarters etc.
- Play with numbers and shapes through games.
- Seeing mistakes as an opportunity to learn and using them as a discussion point.
- Recognising the **importance** and value of maths in our everyday lives e.g. managing money and telling the time.
- Ask them how they know or is there another way?

A quick guide to everyday Maths opportunities for your child



- Practise spotting and recognising numbers in the **environment**. Add/multiply/subtract/divide door numbers, numbers on car registration plates, road signs and at the shop.
- Flicking through the **TV guide**? Ask your child to calculate the length of their favourite programmes. How long is it until the next programme?
- Use **food packaging to discuss 2D and 3D shapes**. What are the properties of these shapes e.g. how many faces, sides, vertices? Flatten the packaging out to find the net of the 3D shape too.
- **Measuring** up for new furniture? Want to make sure the Christmas tree will fit in your living room? These are really good opportunities to encourage your child to see the value of careful measuring skills in everyday life.
- Practise **telling the time** with your child. Can they read both the digital and analogue clock? Can they readily convert between the two and use the 24 hour clock? Can they also recognise Roman Numeral representations of the time too?
- **Board Games** supply endless opportunities for Maths - Snakes and Ladders, Monopoly, Bingo, Connect Four, Battle Ships etc

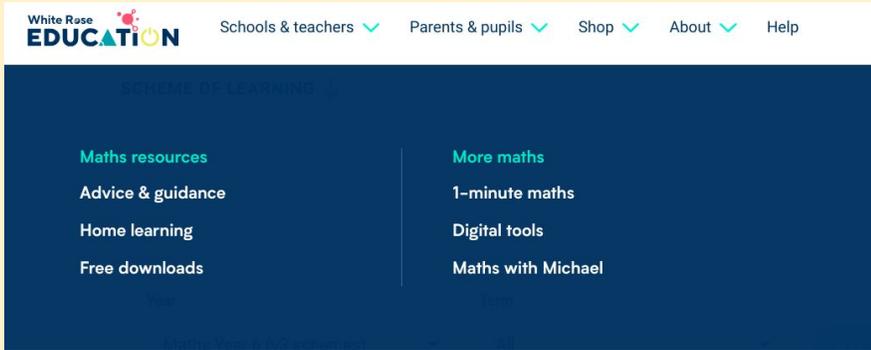


Websites to support children's Maths skills



- [Times Table Rock Stars](#)
- [CBeebies](#) have lots of fun and interactive games and activities to help get our younger children excited about Maths
- [I See Maths](#) - a useful site with a plethora of ideas for fun games that all the family
- [Primary Games Arena](#) - It is a free website that encourages children to play online maths games linked to their home learning. It breaks the games down into concepts which is really helpful.
- [Hit the Button](#) - children love this game as it helps to increase confidence through practising times tables and number bonds.
- [Maths Zone](#) - this site is jam-packed with fun ways to learn more about maths.
- [BBC Bitesize](#) - lots of information alongside short videos help to make the learning enjoyable and accessible for all children.

Videos



Home Learning Videos



Introduce parts and wholes



Part-whole model

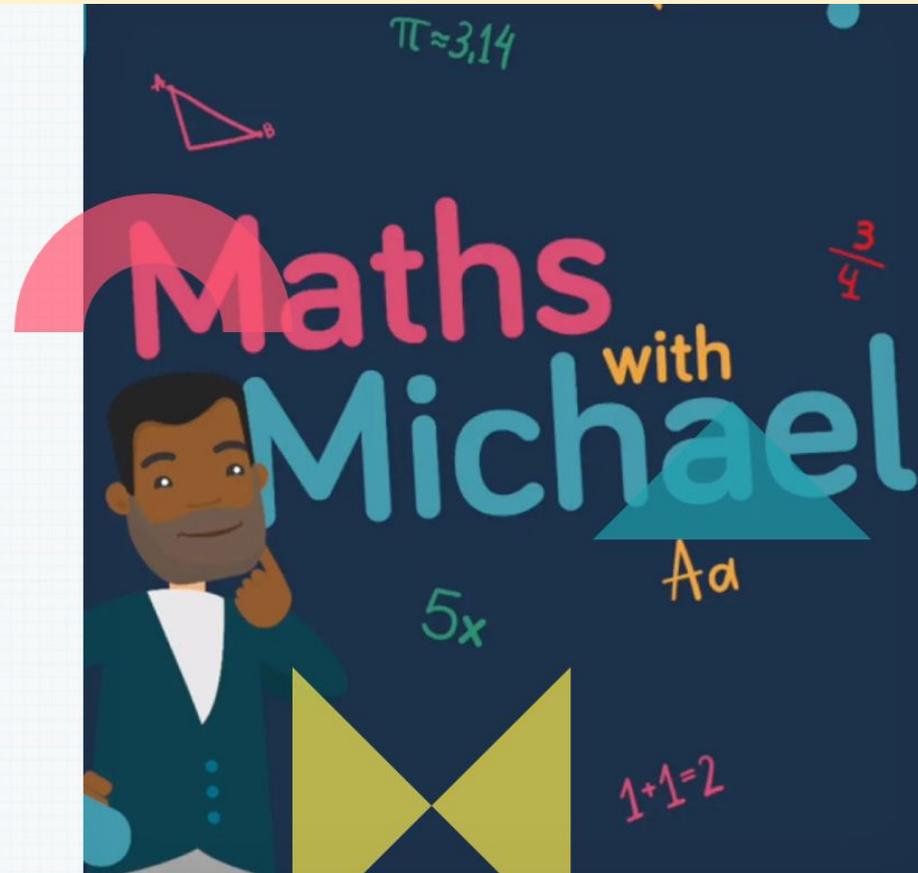


White Rose - Helpful Videos

Maths with Michael

We've teamed up with TV presenter, teacher and parent Michael Underwood to bring you a mini-series called Maths with Michael.

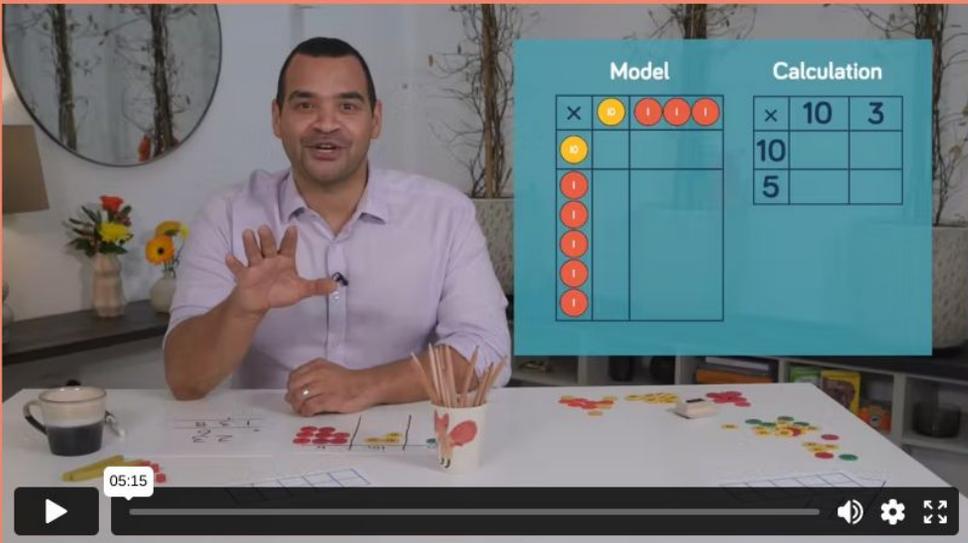
[WATCH THE SERIES](#)



Maths with Michael - parent guides

Each of the six sections has a useful guide with resources that can be printed.

Has maths changed? 1. Place Value 2. Subtraction 3. Multiplication 4. Division 5. Fractions 6. Algebra



The video player shows a man, Michael, sitting at a table with a cup of coffee and a container of sticks. He is gesturing with his hands while explaining multiplication. On the table, there are colorful beads and a grid. The grid is divided into two sections: 'Model' and 'Calculation'. The 'Model' section shows a grid with a yellow bead in the top-left cell, and three red beads in the top row. The 'Calculation' section shows a grid with the numbers 10 and 5 in the first column, and 3 in the first row. The grid is as follows:

Model		Calculation	
×	10	×	10 3
10		10	
5		5	

05:15

GET THE PARENT GUIDE

← PREV NEXT →

White Rose - workbooks

On the website there are links to free workbooks that you can use to support your child's learning at home.

Parent link

Get the free workbooks

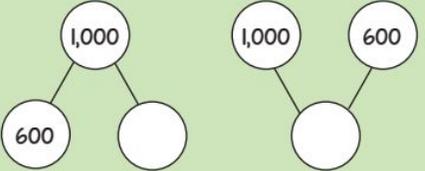
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					
Autumn Block 1 Place value (within 10)	Autumn Block 2 Addition and subtraction (within 10)	Autumn Block 3 Shape	Autumn Block 4 Place value (within 20)	Spring Block 1 Addition and subtraction (within 20)	

3 ADDITION AND SUBTRACTION



From White Rose Maths schemes for Year 3 Autumn Term
BLOCK 2 - ADDITION AND SUBTRACTION

1 Complete the part-whole models.



2 Alex has 262 stickers. She buys 12 more.



How many stickers does she have now?

3 Find the missing number.

$$361 = 9 + \square$$



MATH:

YOU SHOULD NOT ^{only}
KNOW WHAT YOU
ARE DOING. YOU
SHOULD ALSO KNOW

WHY ≠ HOW

HARRY WONG

‘ PLEASE, PLEASE... NEVER say that you are bad at maths ... not anywhere within a 100-mile radius of any child you ever want to influence.’