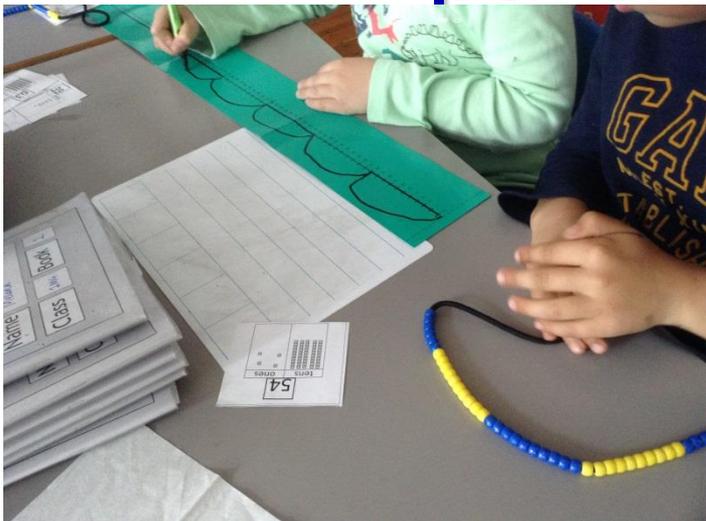




Year 1 and 2 Fluency Maths parent workshop

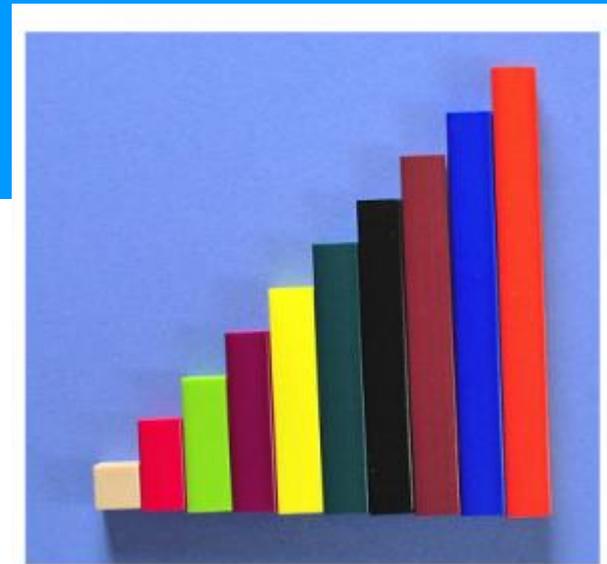


Ros Morgan

Deputy Head teacher

Do Now task

1. Build a staircase out of the cuisenaire. What do you notice?





Objectives:

- Explain and demonstrate how mathematics is taught in Year 1 and 2 at Fox
- Understand what is meant by 'Mastery' in mathematics.
- Identify how fluency impacts upon achieving mastery.
- Increase confidence and understanding in supporting your child at home.



Discuss 3 positive and negative experiences of Maths you had when you were a child.

Fixed vs Growth mindset

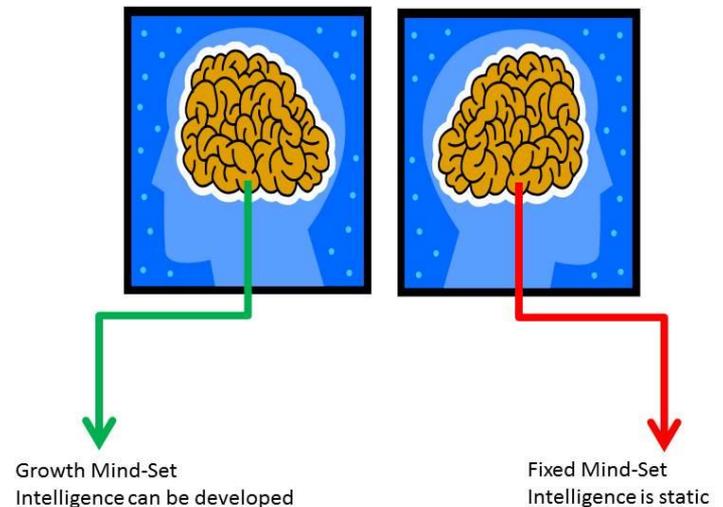
Carol Dweck

*We believe that **everyone** can get better at maths...when they put in the **effort** and work at it.*

- Do not praise children for being clever when they succeed at something, but instead should praise them **for working hard**.
- Children learn to associate **achievement with effort** (which is something they can influence themselves – by working hard!), not 'cleverness' (a trait perceived as absolute and that they cannot change).

If children hear 'I can't do maths' from parents, teachers, friends they begin to believe it isn't important

People become less embarrassed about maths skills as it is acceptable to be 'rubbish at maths'





KS1 statutory curriculum

The curriculum is designed so that pupils explore mathematical ideas **in depth**.

- Number – number and place value
- Number – addition and subtraction
- Number – Multiplication and division
- Number – fractions
- Measurement
- Geometry: properties of shape
- Geometry – position and direction
- Statistics (Year 2 only)

- **Mastery** curriculum
- Reading and spelling of mathematical vocabulary

What does it mean to master something?

- I know how to do it
- It becomes automatic and I don't need to think about it- for example driving a car
- I'm really good at doing it – painting a room, or a picture
- I can show someone else how to do it.

What is mastery in Maths?

"In mathematics, you know you've mastered something when you can apply it to a totally new problem in an unfamiliar situation."

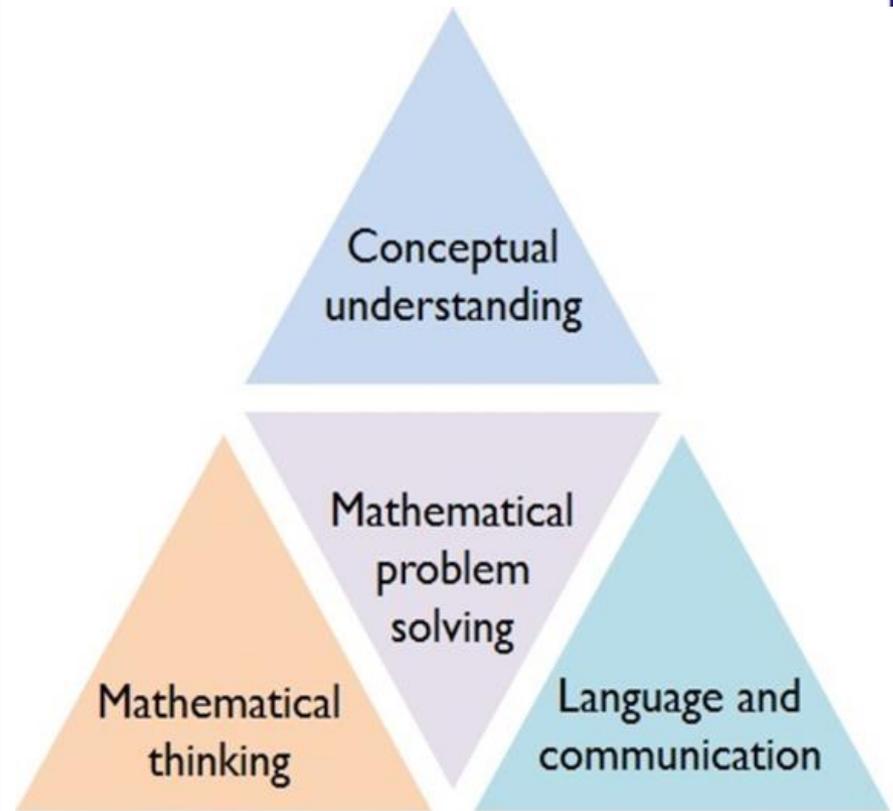
Dr. Helen Drury, Director of Mathematics Mastery

Mastery of Mathematics is more.....

- Achievable for all
- **Deep** and sustainable learning
- The ability to build on something that has already been sufficiently mastered
- The ability to reason about a concept and make connections
- Conceptual and procedural fluency

Mathematics mastery

- Using spoken and written language with confidence and clarity to explain and justify mathematical reasoning.
- Having a deep conceptual understanding of mathematical concepts and skills.
- Developing mathematical thinking, including generalising, classifying and comparing, and modifying.





What does it look like in the classroom?

Children move together i.e. same objective from National curriculum.
Differentiation through scaffolding/resources used.

- 4-5 lessons per week.

Typical lesson is made up of 6 parts:

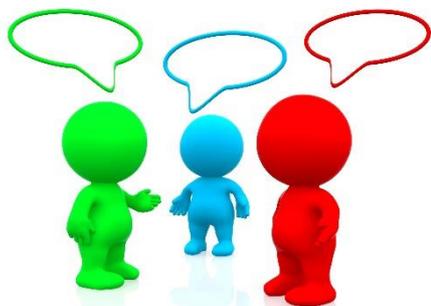
1. Do now
2. Introduce Learning
3. Talk task
4. Develop learning
5. Independent and/or adult led activity
6. Plenary

- Maths Meeting x 3-4/week



Speaking and listening

- Vocabulary
- Questioning
- Full sentences with sentence scaffolds
- Reasoning and explanation
- Problem solving



How do you know?
Can you show me?
Prove it to me...
Can you show me in a
different way?

Example of a talk task

Link between concrete, pictorial and abstract

Ahmed has 12 pencils.

Ahmed divides the pencils equally between 6 pupils.

How many pencils does each pupil have?

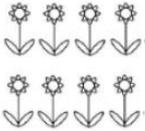
=



Aisha has 8 flowers.

She shares them equally between two teachers.

How many flowers does each teacher have?



We are learning to recognise the relationship between numbers in division equations.

Divide 12 books into groups of 2.



There are 12 books altogether. We are dividing 12 into groups of 2. I am going to group the unifix in twos, 2, 4, 6, 8, 10, 12.

Divide 12 books into groups of 2.



There are ____ groups of 2.

12 ÷ 2 =



There are 6 groups of 2. 12 divided by 2 is equal to 6.



Note the focus on language and 'self-talk' through maths.



Maths Meetings

- Aim is to continually revise previously taught objectives.

Months of the Year

January	July
February	August
March	September
April	October
May	November
June	December

30 days has September, April, June and November. All the rest have 31 Except February alone, Which has 28 days clear And 29 in each leap year.

Last month was... This month is... Next month will be...

Hey pattern, you're so neat, 'cos you repeat. Hey pattern... x 2

increasing ↗ ↘ decreasing

What comes next?

302, 303, 304, 305, 306, 307, 308

Fact family

•	
•	•
•	•
•	•

Animals on Old McDonald's Farm

Number of Animals

Horses Cows Roosters Sheep

Type of Animal

🐮 = 5 animals

SUPER CHALLENGE

How many cows are there on the farm?

What animal are there the least of?

What animal are there the most of?

86, 76, 66, 56, 46, 36

Quarter To Quarter Past Past O'clock Half Past

Fluency

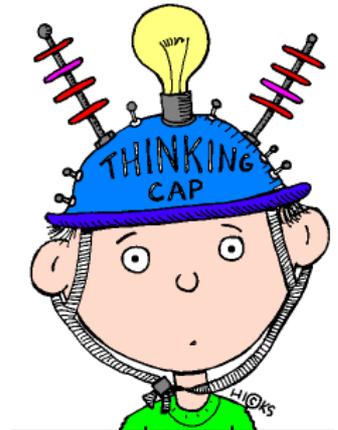
Conceptual fluency +
procedural fluency = **MASTERY**



Fluency = how **fast** a person can retrieve correct maths facts **to** working memory **from** storage memory.

What are the implications for this?

Storing in Long term Memory needs lots of rehearsal, repetition and regular retrieval.





What else does number fluency entail?

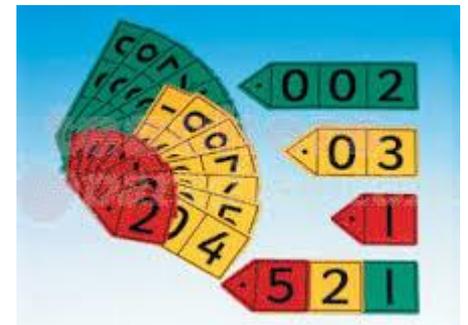
Number fluency

- Three key goals – efficiency, accuracy and flexibility.
- **Efficiency** – children have strategies that they understand, that don't have too many steps, where they can keep track of their working etc.
- **Accuracy** – children can record carefully, use known facts correctly and check their answers.
- **Flexibility** – children can choose appropriate skills and strategies to solve problems.

Place Value



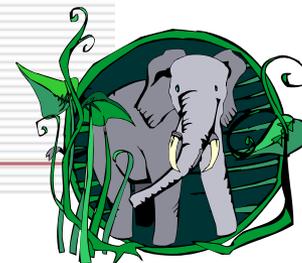
Place value is at the heart of the number system. All digits have a value and a secure understanding of this will enable children to use and understand different calculation methods.





A Conversation between Patrick (aged 4) and Mark (professor in teaching of mathematics):

- Mark: What is four and one more?
 - Patrick: Six
 - Mark: What is four giraffes and one more?
 - Patrick: Five giraffes
 - Mark: What is four elephants and one more?
 - Patrick: Five elephants
 - Mark: What is four and one more?
 - Patrick (looks him in the eye): Six.
-



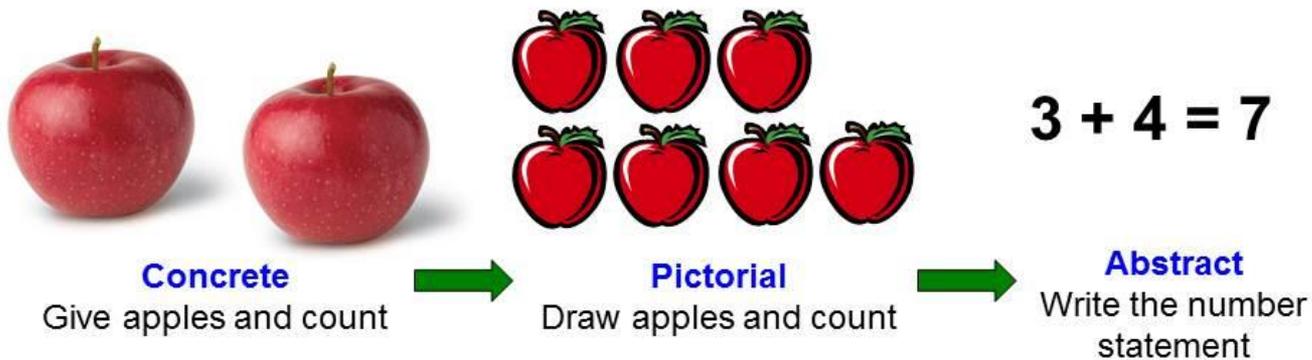
Key models and images used in KS1

- CPA approach – Concrete, Pictorial, Abstract
- Part, part whole
- Ten frame
- Place Value chart
 - Dienes, Cuisenaire

CPA Approach	
Stage	Characteristics
Concrete	Refers to the use of manipulatives, measuring tools or objects that the student handles.
Pictorial	Refers to the use of drawings, diagrams, charts or graphs that the student draws
Abstract	Refers to abstract representations such as numbers and letters that the student writes

Example:

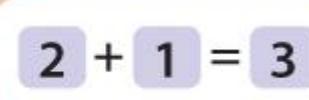
Tom had 3 apples. His mother gave him 4 more apples. How many apples did he have altogether?




CONCRETE



PICTORIAL

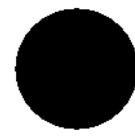
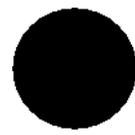


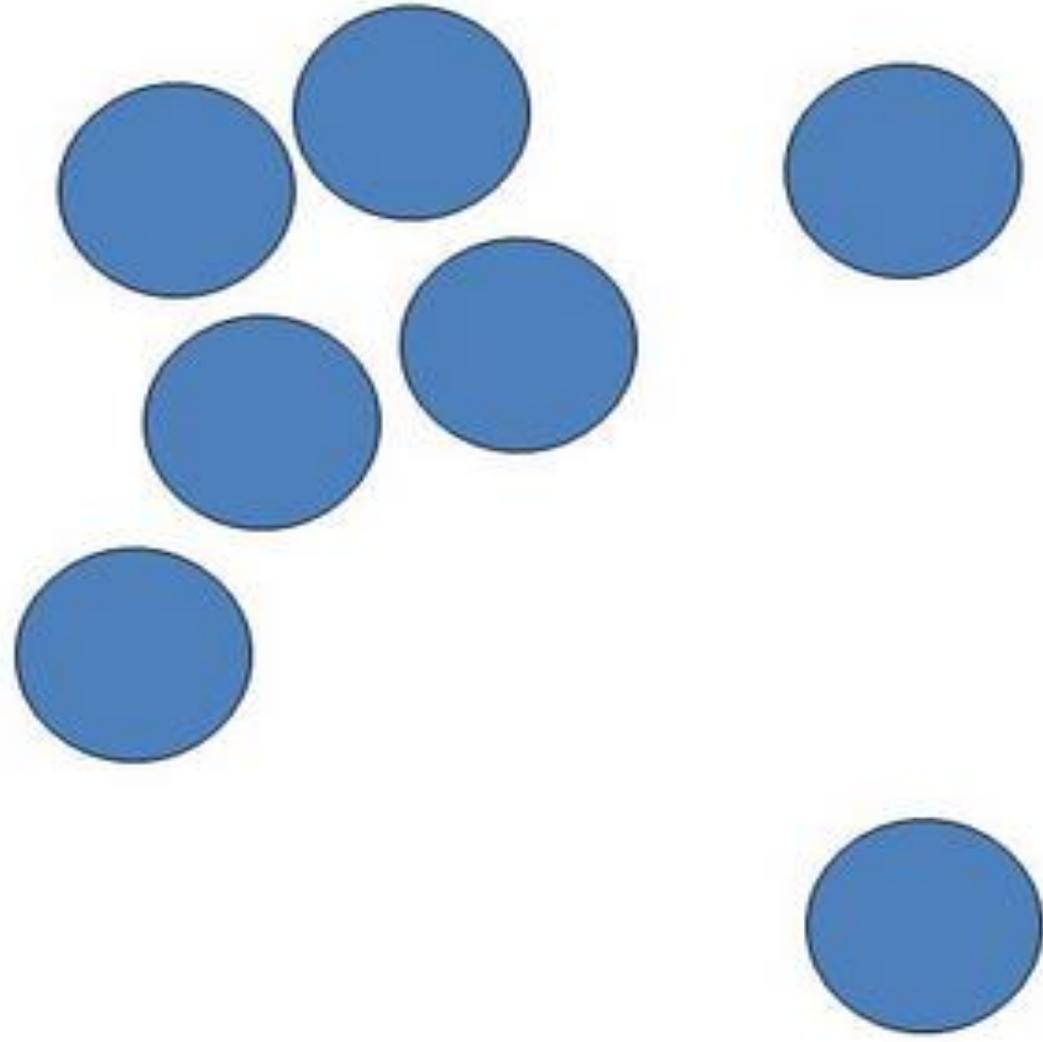
ABSTRACT

Subitising

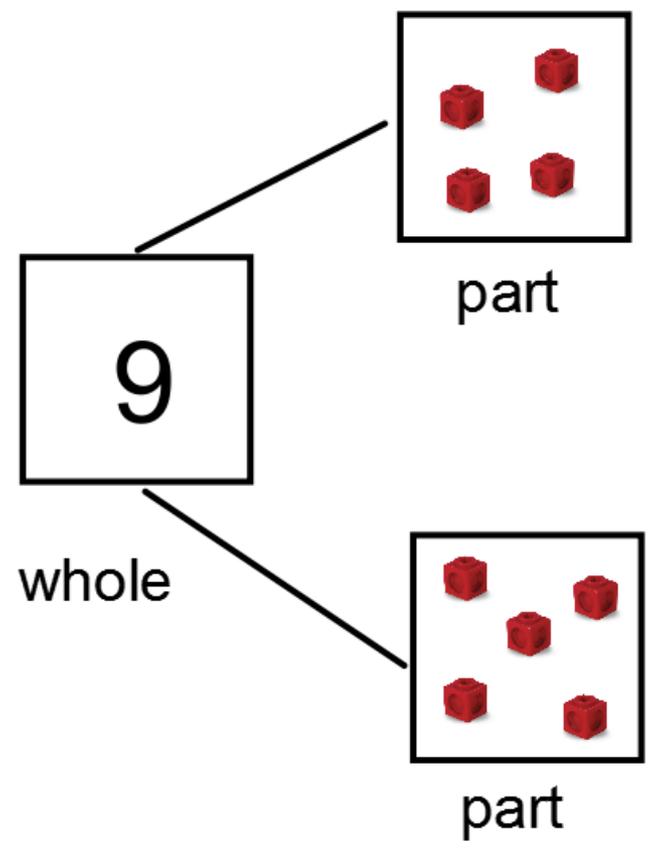
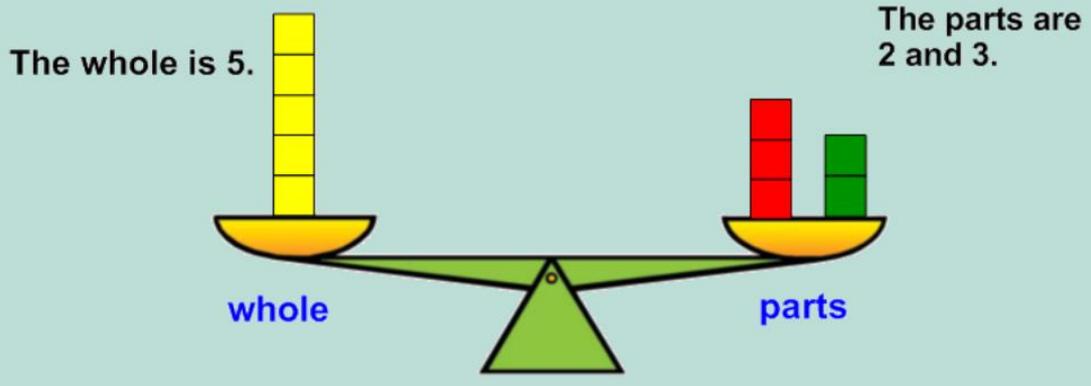
helps children to develop:

- cardinal number values
(procedural subitising)
- part whole relationships
number facts
- abstract strategies
(conceptual subitising)

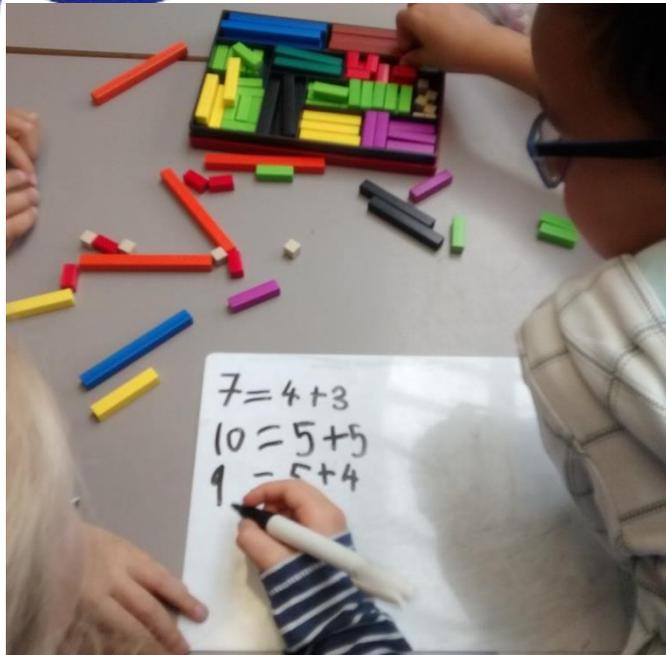




Part-part whole and number bonds



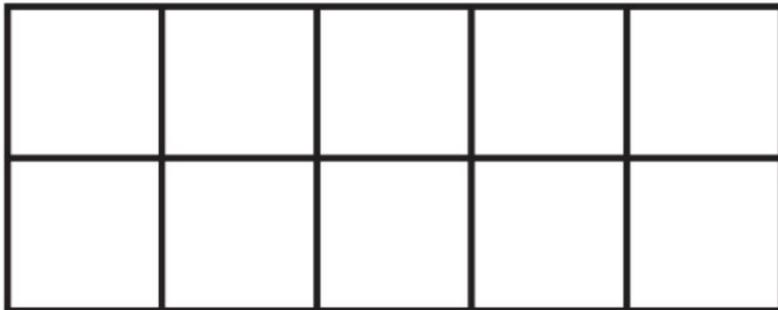
Importance of number bonds and concept of part-part –whole continues...



Ten frame

We are learning to count sets of objects within ten.

ten frame



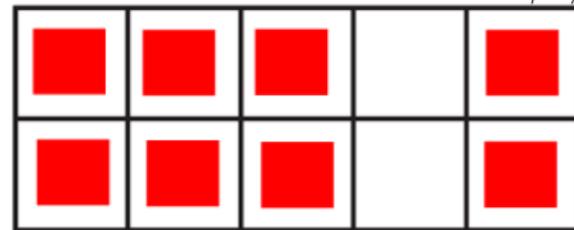
infinite clone



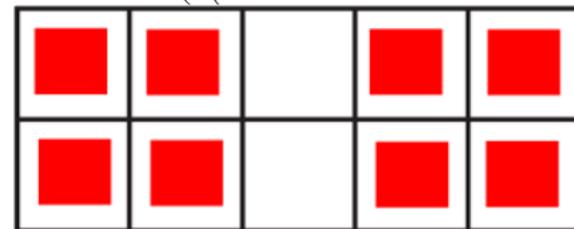
This is a picture of a ten frame that can be used alongside the ten frame and cubes on the carpet. Model placing the cubes on top of the images you are counting and moving them to the ten frame.

Task 2D

There are 8 cubes.
I see 6 and 2.



There are 8 cubes.
I see 4 and 4.



How do we do this....?

Lots of practice!
Short and regular rather
than long and irregular.

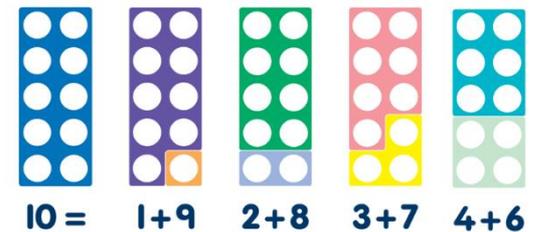
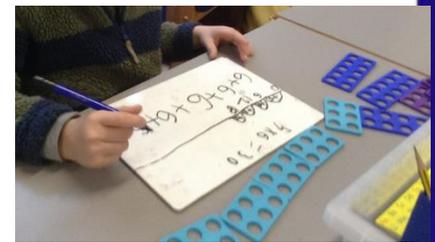
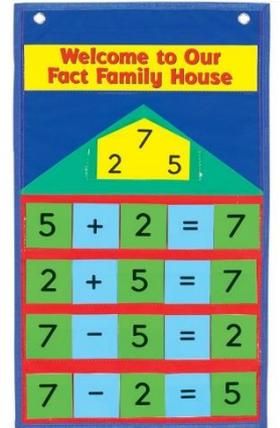


Daily Practice
10-15 minutes
a Day



What facts do they need to be able to recall?

- Number bonds
 - Addition and subtraction facts.
 - One/two/ten more/less than a number.
- Doubles and halves
- Near doubles (eg. $4+5 =$ using knowledge of $4+4$)
- Skip counting (1s, 2s, 10s, 5s, 3s)
- Times tables (up to 12)



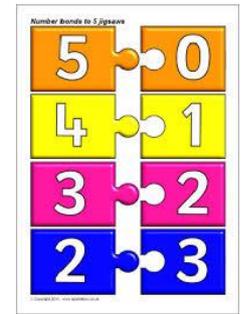
It is important that children recognise number bonds, different pairs of numbers with the same total.

$7 + 3$

$6 + 2$



$5 + 3$



$1 + 4$

$6 + 4$



$6 + 1$



$6 + 3$

$3 + 4$

$5 + 4$



$3 + 3$

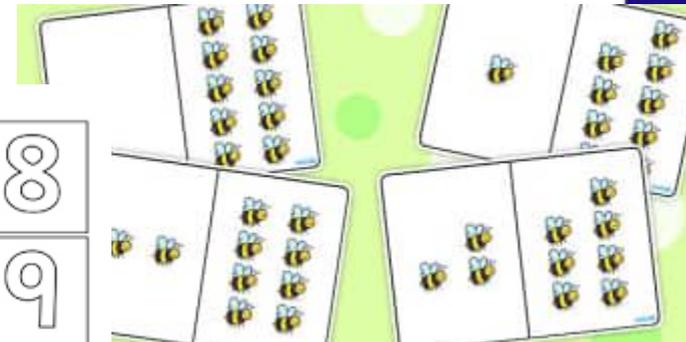
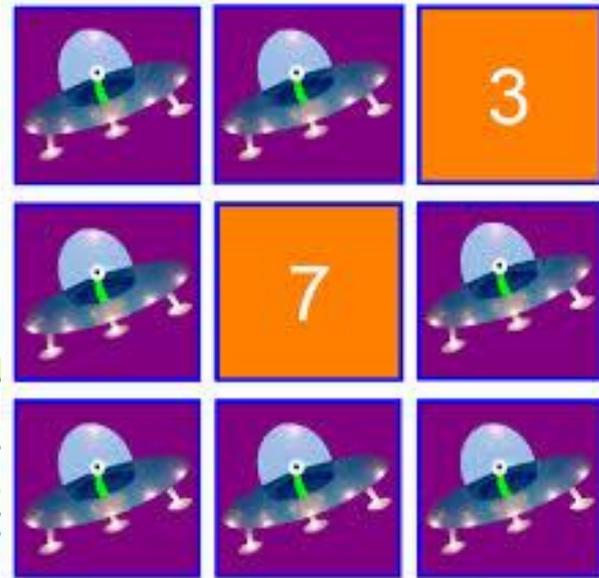
Magic bean game

- Choose a number or a number card
- Count that number of beans.
- Hide some.
- How many are hidden?
- How do you know?



Pelmanism/ Memory games

- Make own resources using pictorial or abstract.
- Adapt.



Pelmanism Instructions

The word pelmanism is associated with memory. While the game is often called "pairs", "pelmanism" is a better word as memory is required to remember where cards that have been turned over are placed.

Therefore it is important that cards are placed in one logical row - instead of randomly turned over - as this helps children develop memory skills as well as required.

This pack contains individual cards with numbers and cards with mathematical symbols. This set requires 2 pairs that are required.

To play

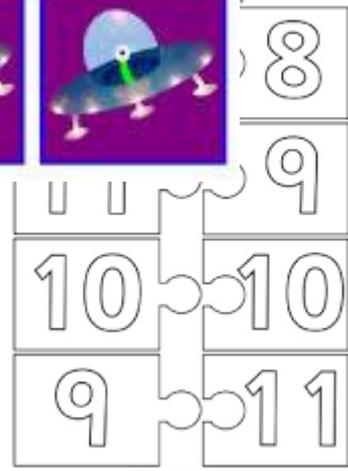
1. Place all cards face down - either in a random pattern or a 3x3 grid.

0 + 7

6 + 4

2 **2 + 7**

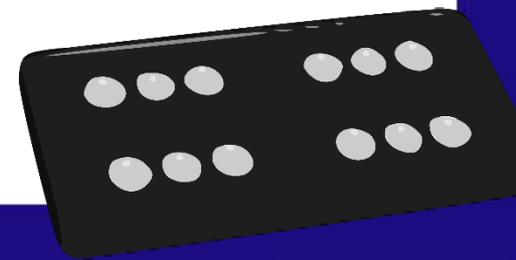
2 **1 + 4**





Number line ideas

Draw a line. Mark 0 and 10 (or any number range needed). Roll a dice. Decide where that number would go and write it in. Repeat. You can also start at any number and include whatever your child needs.



Fingers game

Videos



Fun games

Watch the Video

Fun games

Mathemagician Andrew Jeffrey shows us how to use games to practise times tables.

[Watch the video](#)

Times tables

- 2s
- 5s
- 10s
- 3s
- 4s (from the 2s)
- 6s (from the 3s)

Dice Games

- <http://www.sowevalleyprimary.co.uk/documents/DiceGames-plus.pdf>



DICE GAMES

Cover the Windows



mathsticks.com

You will need:

- 2 players
- A quantity of counters for both players
- 2 dice (1-6 spots or numbers)
- A window game board

The window game board consists of two windows with identical numbers. Players sit side by side and play on their own window.



How to play:

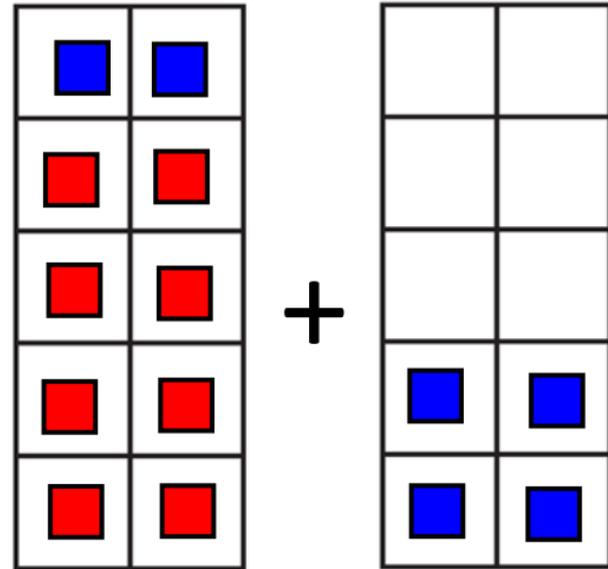
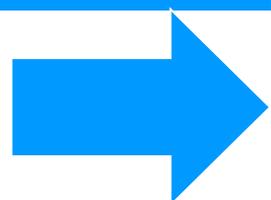
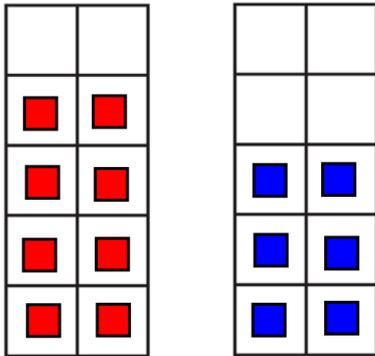
Players take turns to roll both dice, they add

Make 10 strategy

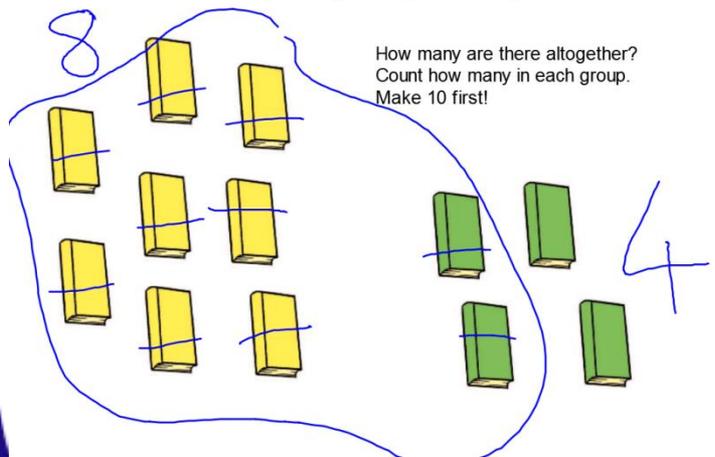
To add two single digits by making ten first

How many cubes need to be added to the group of eight to make ten?

$$\square = \square + \square$$



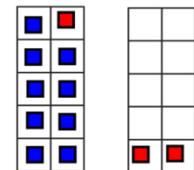
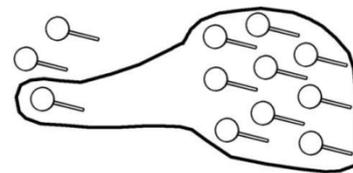
To add two single digits by making ten first



How many are there altogether?
Count how many in each group.
Make 10 first!

To add two single digits by making ten first

Independent task



$$3 + 9 = 12$$

$$10 + 2 = 12$$

$$2 + 10 = 12$$

Inbetweens

- Start by asking for a 2 digit number. Place it at the start of the line. Now ask for a higher 2 digit number and place at the end of the line. Now keep asking for numbers in between.
-

Tug of war – Nrich website

One player is called "PLUS"

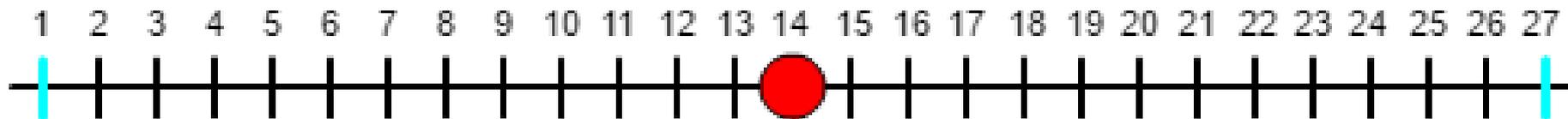
The other is called "MINUS" so decide who is who.

Plus moves from left to right and Minus moves from right to left. (The children may be encouraged to think about why that might be.)

Take it in turns to throw the two dice and add up the numbers on the two dice.

Move that number of places in your direction.

If the counter reaches 1, Minus has won and so, of course if the counter reaches 27, Plus has won.



Maths Seeds

<http://mathseeds.co.uk/>



Discover the fun way to grow your child's maths skills!

Mathseeds teaches kids aged 3-8 the core maths and problem solving skills needed to be successful at school with fun, highly interactive and rewarding lessons.

Mathseeds combines highly structured lessons with fun motivational elements that keep children engaged and keen to learn.

Your kids can start learning with Mathseeds anytime and anywhere there is a computer or tablet – just click the 'free trial' button to get started!

FREE TRIAL

Parents START HERE

Already a member? [LOG IN](#)



"At first I was worried that my son was having too much fun and would not actually be learning! But his maths is coming along amazingly. And he is begging me to play! Thank you Mathseeds team." – Patrick

[Read more](#)

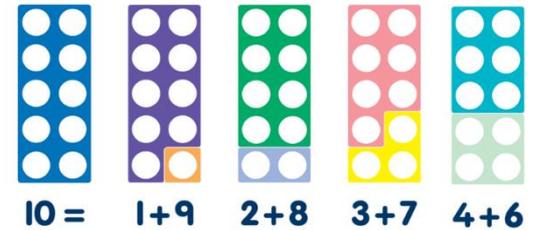
Kids learn while having fun with vibrant animations, songs and multiple rewards

Help your child learn to read!

Reading eggs

Web sites to use for practising fluency and other resources...

- Oxford Owl Maths
- NNS parents tool kit
- Top Marks times tables
- Maths is fun
- [Woodlands resources](#)
- Free numicon resources
- Nrich [website](#)



Resources on school website

- www.fox.rbkc.sch.uk
- Calculation policy
- Progression in calculation
- Pitch and expectations

YEAR 2

Calculation Strategies

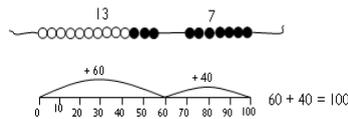
Number Stories

There are 50 people on the bus 16 more get on how many altogether?



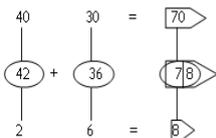
Number bonds

Use knowledge of number bonds to 10 to help with bonds to 20 and multiples of 10 to 100

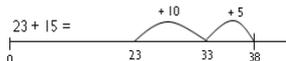


Addition as partitioning and recombining:

$$42 + 36 =$$



$$12 + 23 = 12 + 20 + 3$$



Year 1

Addition and Subtraction

- Read, write and interpret mathematical statements involving addition, subtraction and equals signs
- Represent and use number bonds and related subtraction facts within 20
- Add and subtract one digit and two digit numbers to 20, including 0
- Solve one step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = ? - 9$
- Children understand the effect of adding and subtracting zero. This establishes the relationship between the two operations.
- Understand that addition can be done in any order but subtraction cannot.

Mental Strategies

Teachers and/or pupils may demonstrate these strategies on a numbered number line supported by a variety of materials.

Children know by heart and reason with number bonds to 10 and 20 in several forms.

$$9 + 7 = 16$$

$$16 - 7 = 9$$

$$7 = 16 - 9$$

$$9 - 6 = \square - 4$$



Same diff: 5-3 equals 6-4 equals 7-5

Balancing: 5 add 5 equals 6 add 4 equals 7 add 3



Addition

Reorder numbers when adding, e.g put the larger number first

Please do...



- Play (maths) with your child
- There are opportunities for impromptu learning in games with real people that you can't get from an ipad or DS!
- Let your child win or be better than you!
Otherwise all they learn is that you are better at maths than them
- Recognise that there is more than one way of doing calculations
 - You may have learned one method, but children are actively encouraged to seek out alternative methods in school and choose one which works for them, no matter how long winded.
- Be an actor!
 - Get excited about maths and your child will get excited too.



Please try not to....



- Don't expect them to understand after you've explained it once.
 - It is normal for a child to 'get it' one day, and then in a different context not know how to find an answer
- Don't tell them you are hopeless at maths
 - You may remember maths as being hard, but 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”
- Don't get into an argument over homework.
 - It will be something that your child has covered in class, and if they really can't do it without a lot of tears and frustration, leave it and LET US KNOW!



Chinese Bamboo



When you plant it, nothing happens in the first year, nor in the second year or the third or the fourth years. You don't even see a single green shoot.

And yet, in the fifth year, in a space of just six weeks, the bamboo will grow nine feet high.

The question is, did it grow nine feet in six weeks or in five years?



Game - Cool and uncool...

5

10

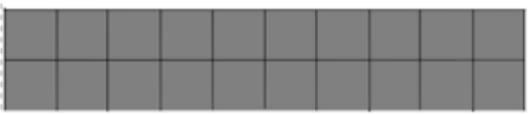
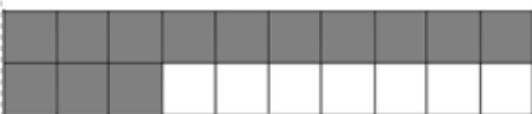
12

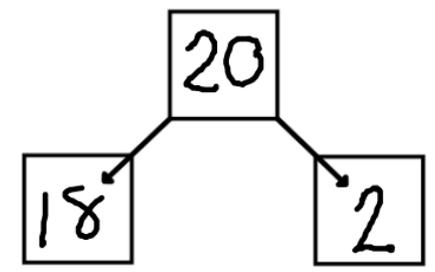
COOL
AND
UNCOOL



$24 + 3 = \square$	
	$+$
$32 + 5 = \square$	
	$+$
$13 + 6 = \square$	
	$+$
$46 + 2 = \square$	

Write an addition equation for each 20 frame.

	$20 + 0 = 20$
	$17 + 3 = 20$
	$13 + 7 = 20$
	$19 + 1 = 20$



Make 10 strategy

■ Let's have a practise. Make these equations using make ten strategy.

■ $\underline{\quad} = 8+6$

■ $5+9 = \underline{\quad}$

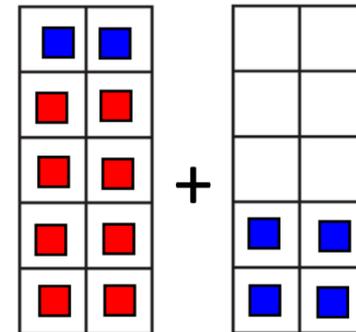
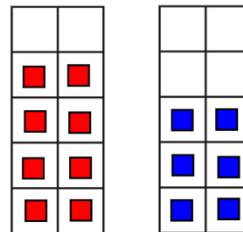
■ $\underline{\quad} = 7+6$

■ $3+8 = \underline{\quad}$

■ $6 +9 = \underline{\quad}$

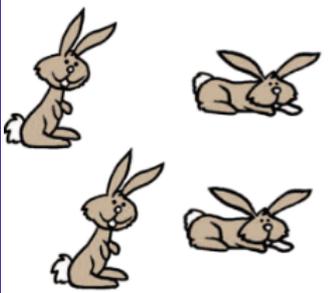
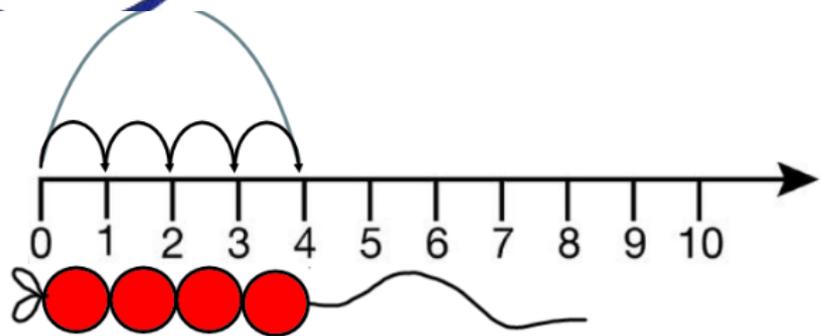
To add two single digits by making ten first
 How many cubes need to be added to the group of eight to make ten?

$\square = \square + \square$



■ What number bonds will your child be practising?

Number line and Bead string



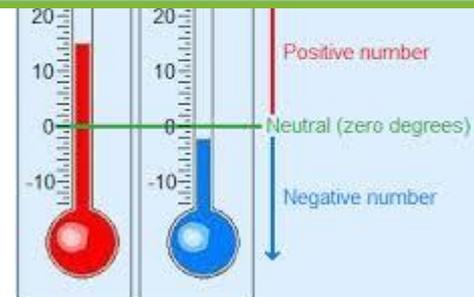
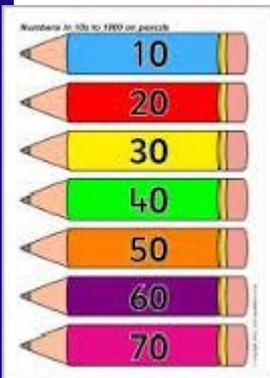
Circle 4.

What is **one more** than 4?

_____ is **one more** than 4.

Keep Counting!

- Backwards and forwards in 1s, 2s, 5s, 10s, 100s.
 - Count with money.
 - Pairs



How can you help at home?

- Fluency is key
 - Number facts
 - Including subtraction facts as well.
 - Doubles and halves
 - Skip counting
 - Times tables
- Practise, practise, practise!
- Other activities can include:
 - Practise writing number formation
 - Match words to numbers
- **Think and talk like a mathematician**