Maths Mastery:
Early Years to Year Two

Feel free to peruse the handouts on the tables – there is a selection of work from KS1 books which shows specific mathematical concepts as well as some question examples

What is Maths Mastery?

- Mastering maths - pupils of all ages acquiring a deep, long-term and adaptable understanding of the subject.
- 'Teaching for mastery' - elements of our classroom practice that gives pupils the best chances of mastering maths.
- NCETM Maths Hub – teachers are trained as mastery specialists.
- 'I just can't do maths' – teaching for mastery rejects this idea. **ALL** pupils are encouraged by the belief that working hard and working within the strategies in the programme mean they can succeed.

Mastery in Maths

Our aim today is equip you with the skills to help support your child in understanding number and challenge them.

- **Fluency**
- **Rapid number facts**
- **Variation**

Vocabulary

- exchange
- calculation
- number sentence
- oblong 

hundreds tens ones
H T 1's

digit → **62** number **62**

- borrow or steal
- sum = total
- rectangle (family name)

- units

Addition

$$6 + 7 = 13$$

addend addend sum

Subtraction

$$13 - 8 = 5$$

minuend subtrahend difference

Multiplication

$$6 \times 8 = 48$$

factor factor product

Division

$$48 \div 8 = 6$$

dividend divisor quotient

Number

Fluency

Reasoning

Problem solving

Concrete
Pictorial
Abstract

Reception

Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number.

Year One

Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number.
Count, read and write numbers from 1-100 in numerals and words.

Use counting strategies to solve problems

Year Two

To read and write numbers to at least 100 in words and numerals.
To use the signs: <, > and =
To compare and order numbers 0 to 100.
To identify, represent and estimate numbers.

Number

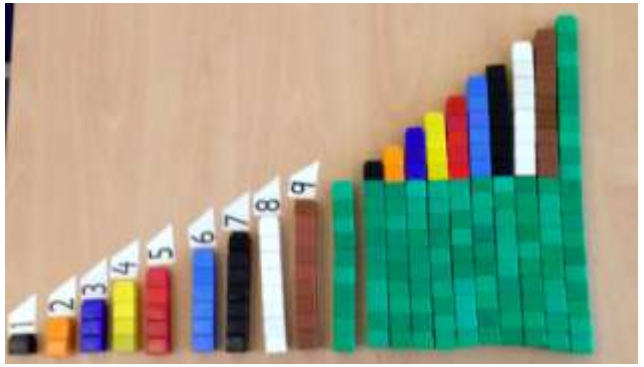
Early Years

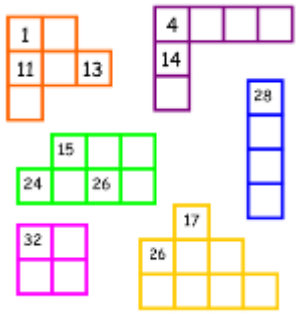
- Matching amounts
- 1:1 correspondence
- Finding the total

1	2	3	4	5	6	7	8	9	10
one	two	three	four	five	six	seven	eight	nine	ten

Years One and Two

- Counting (reliably)
- Comparing (>,<, where numbers are in relation to one another)
- Composition (what's hidden inside numbers, structures)

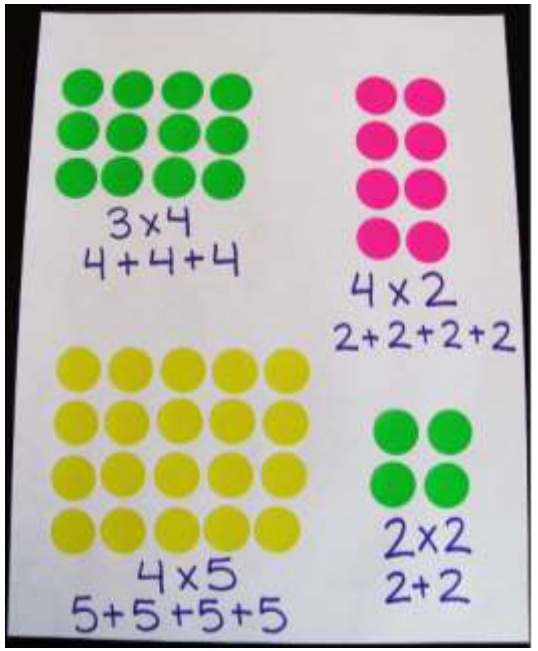




Fluency in Number

Fluency demands more of learners than just memorisation of facts.

E.g. Counting in 2s, 5s and 10s



It encompasses a mixture of efficiency, accuracy and flexibility.

Scaffolding the talk – stem sentences

- One less than__ is ___
- I have counted ___ altogether
- __ comes after/before ___
- ___ has more than ___ because___
- __ has the least because___
- __ more than ___ is ___
- I have __ and he has __ so we have ___ altogether
- I had __ and took ___ away so now we have__

My whole number is 10. Part of my number is 4, the other part is 6.

60 is the same as 6 tens.
9 tens is the same as 90.

Progression in number skills

$7 - 3 = 4$

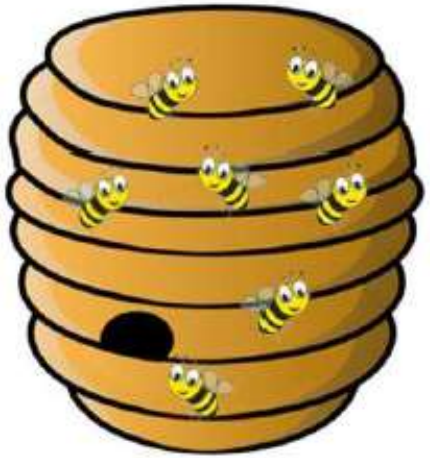
$7 - 4 = 3$

$3 + 4 = 7$

$5 = 7 - 2$

Talk task

How many calculations can you complete?



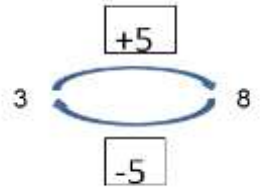
$\square = 7 - \square$

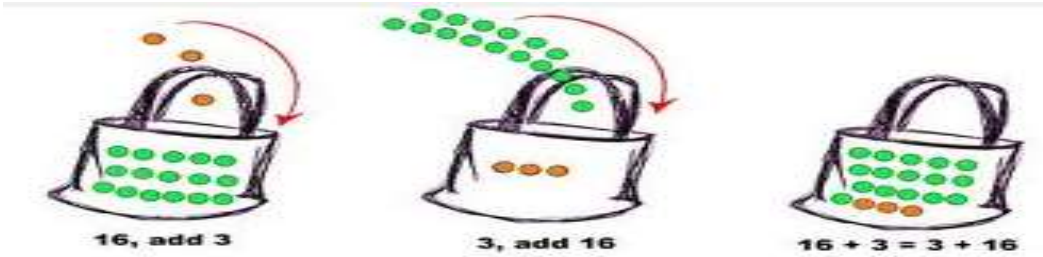
Why can't the digits 8 or 9 be used?

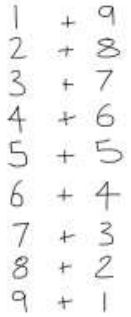
Variation and representations

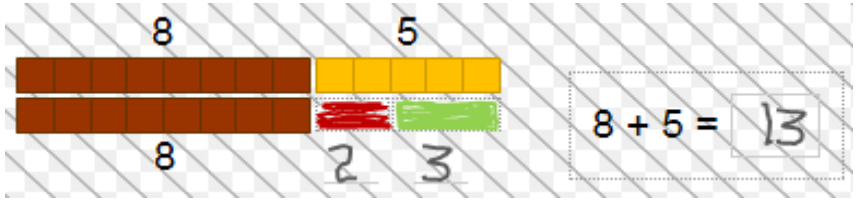
Conceptual variation

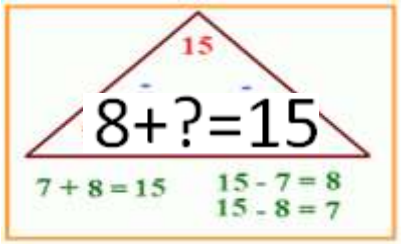
The opportunity to work on different representations of the same mathematical idea.

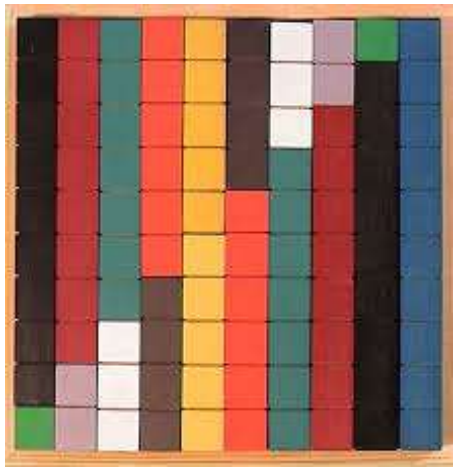


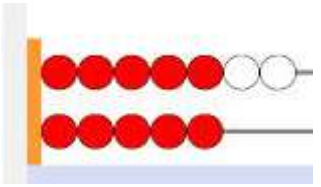




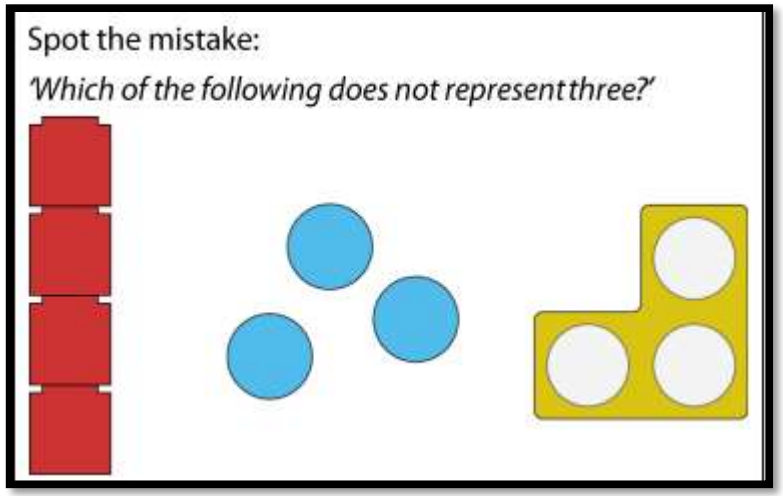


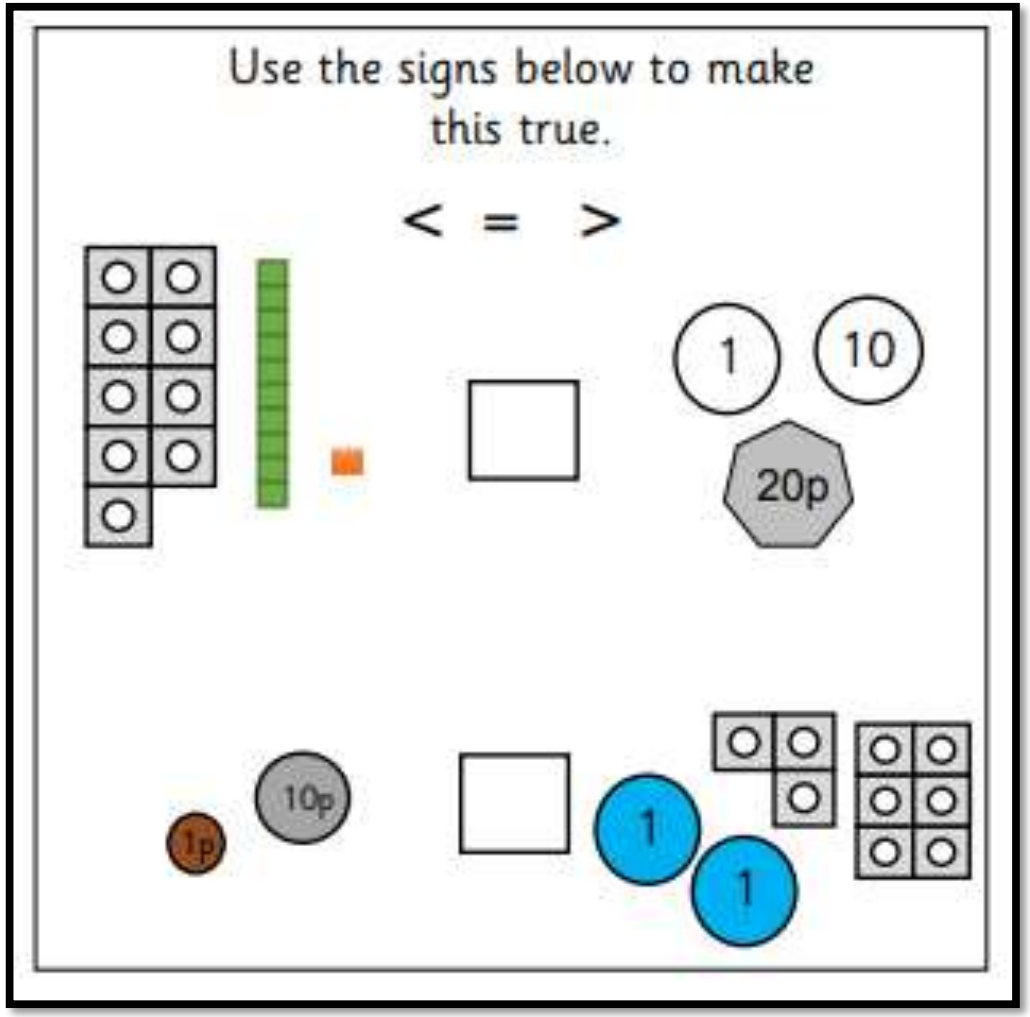






Variation and representations





Challenges

- Are bigger numbers challenging your children?
- Is there an easier way to work out the answer?

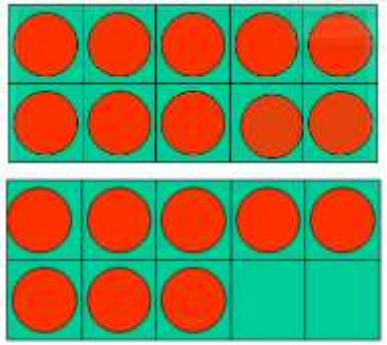
Which questions are easy, which are hard?

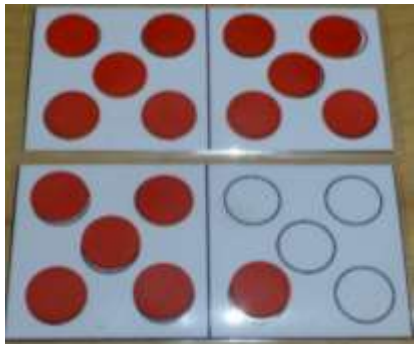
453 + 10 =	930 – 100 =
493 + 10 =	910 – 120 =

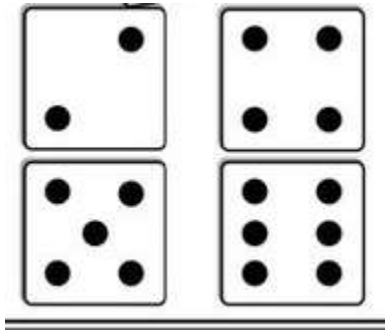
Why are some easy and some hard? Explain your reasons.

- Partitioning?
- Using 100 square
- It is ok to give your child manipulatives to work out answers!

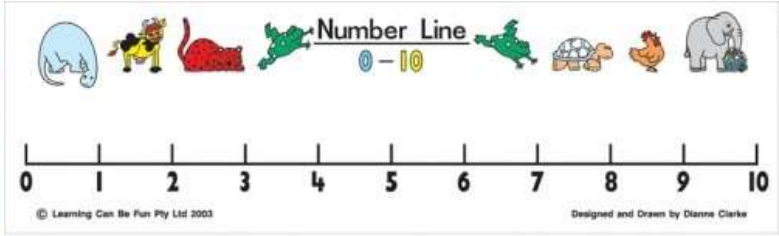
Manipulatives

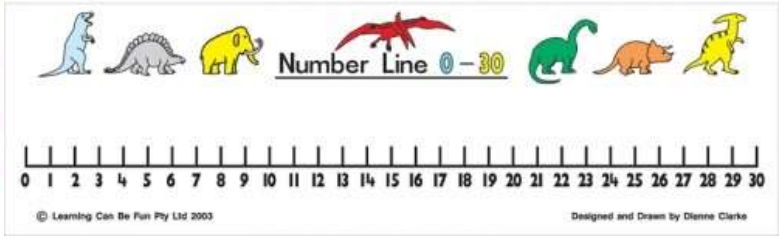






1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100





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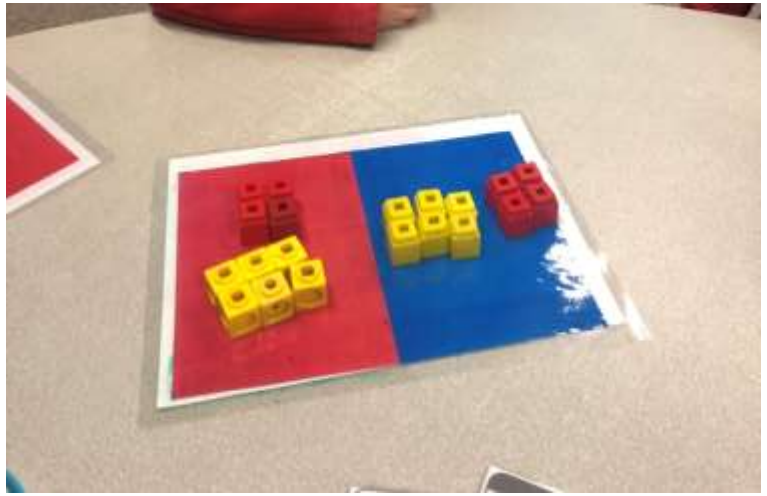
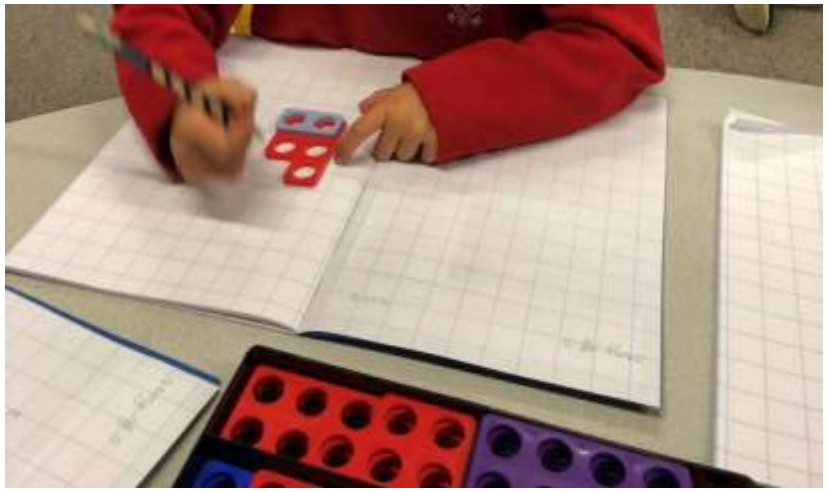
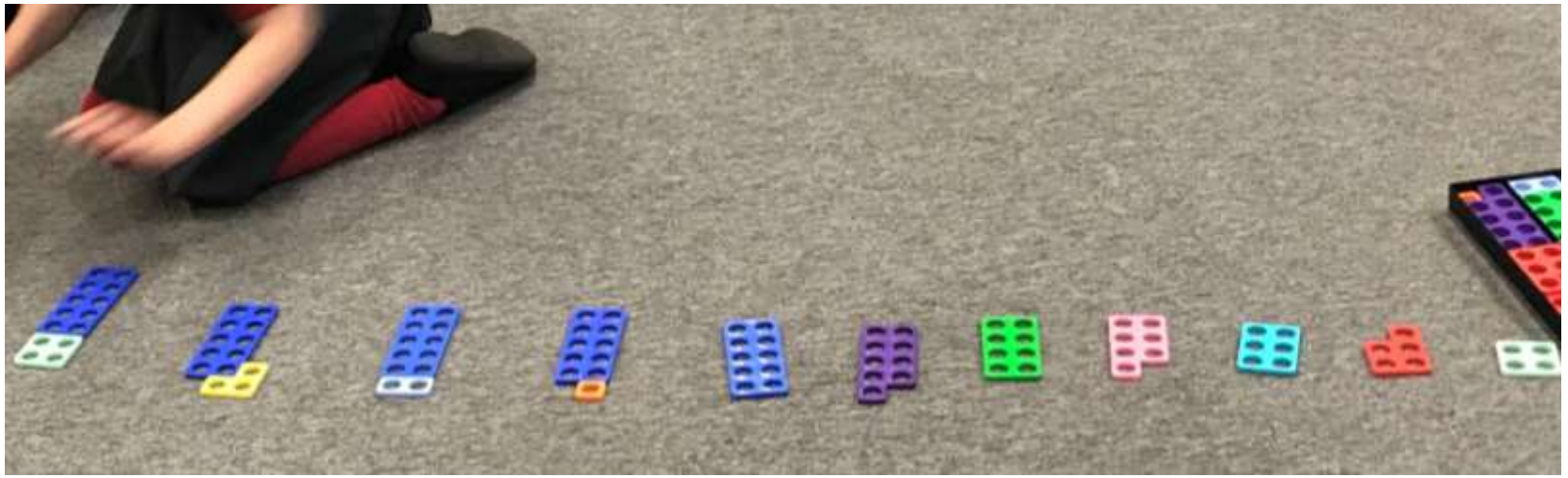
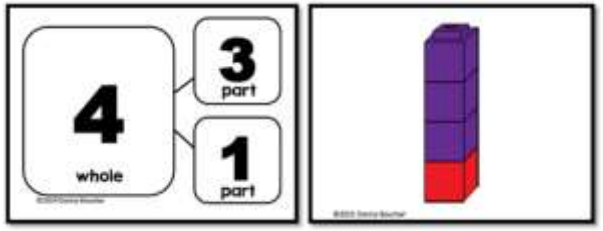


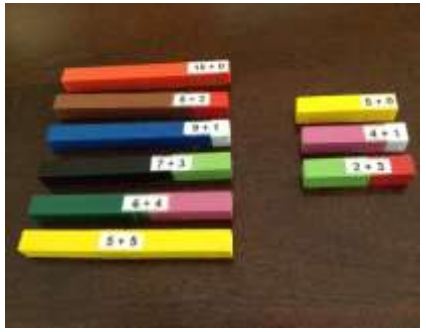


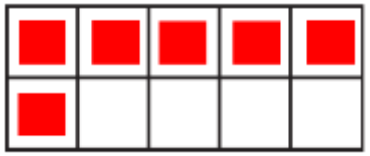


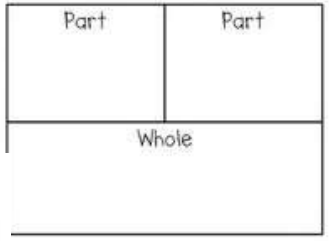
CPA

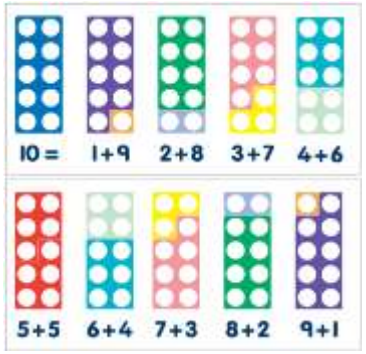
Concrete → Pictorial → Abstract

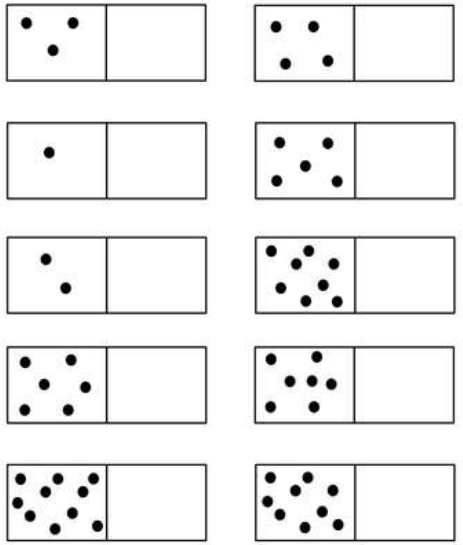


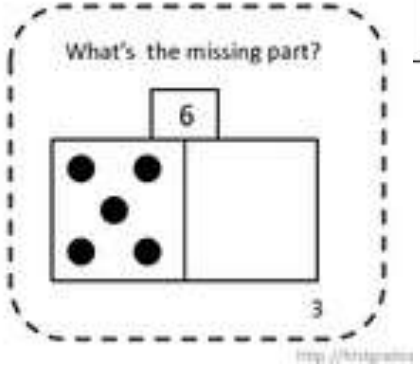


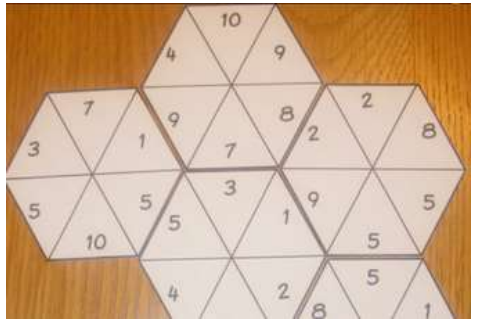








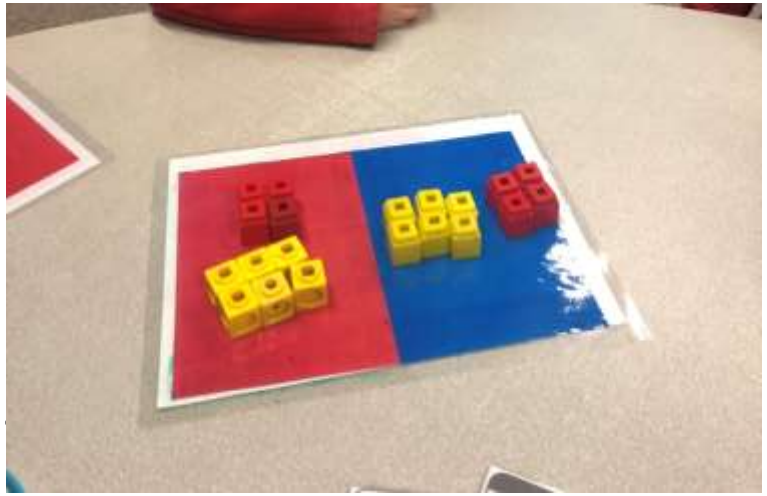




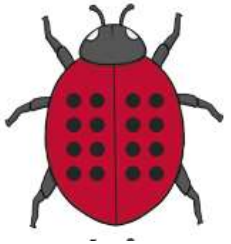
CPA

Concrete → Pictorial → Abstract

- Concrete



Pictorial



8+8=_____

Sita earns £10 every time she helps her mum tidy the house. If she helps her mum 2 times, how much money does she earn?

Mastering Early Number

NCETM Maths Hub: Mastering Early Number

- 5x 1 hour maths lessons each week – National Curriculum/ White Rose and NCETM to support teaching

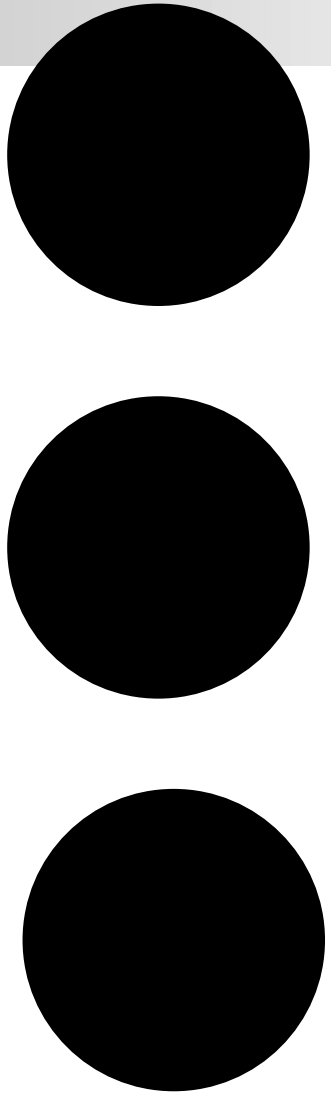
- 4x 15 minute 'Early Maths Mastery'
  - This project aims to secure firm foundations in the development of good number sense for all children from Reception through to Year 1 and Year 2. The aim over time is that children will leave KS1 with fluency in calculation and a confidence and flexibility with number.

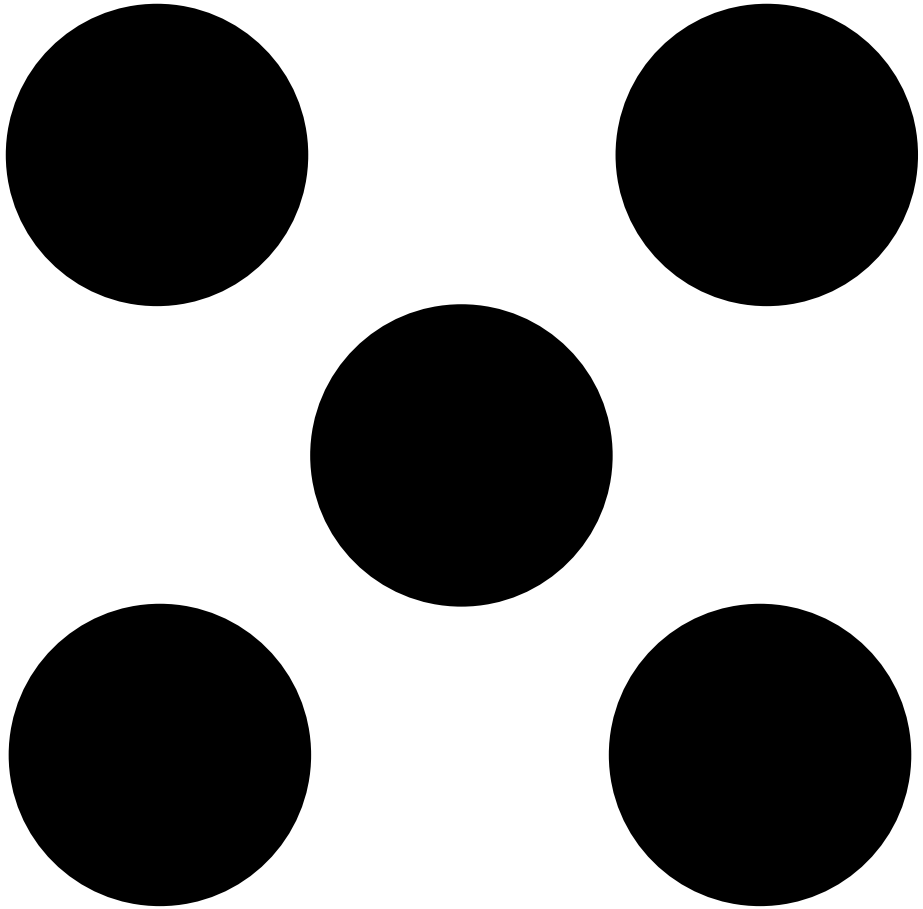
https://www.ncetm.org.uk/maths-hubs-projects/mastering-number-at-reception-and-ks1/

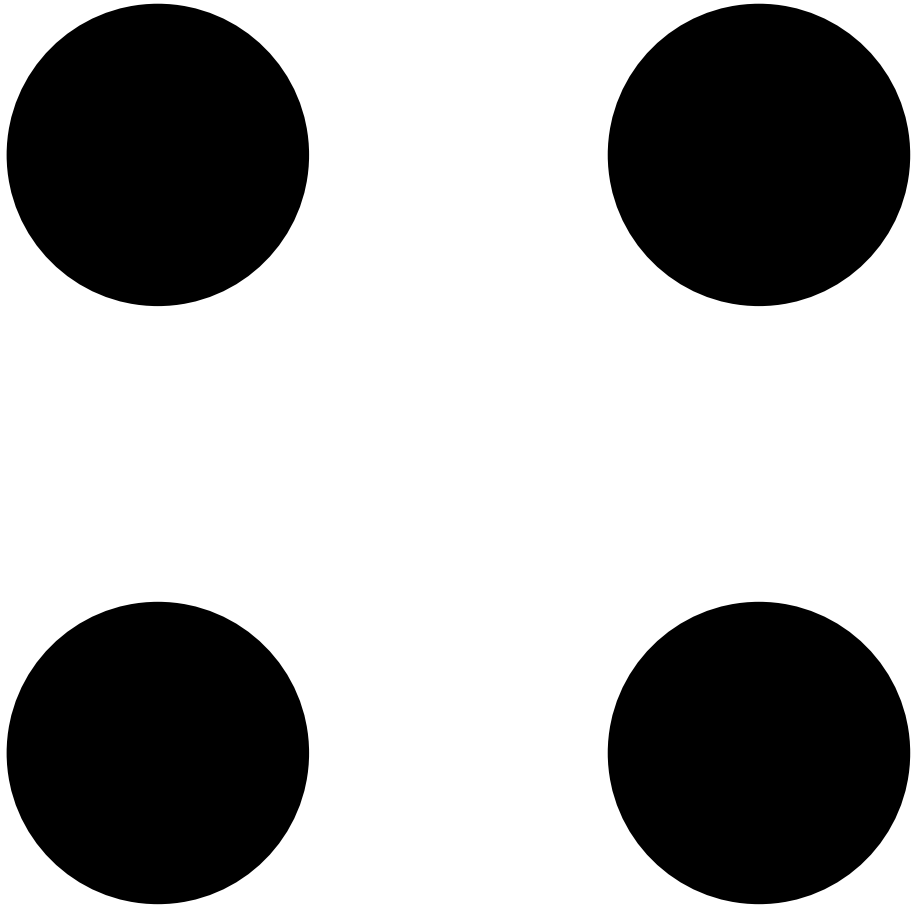
Mastering Early Number

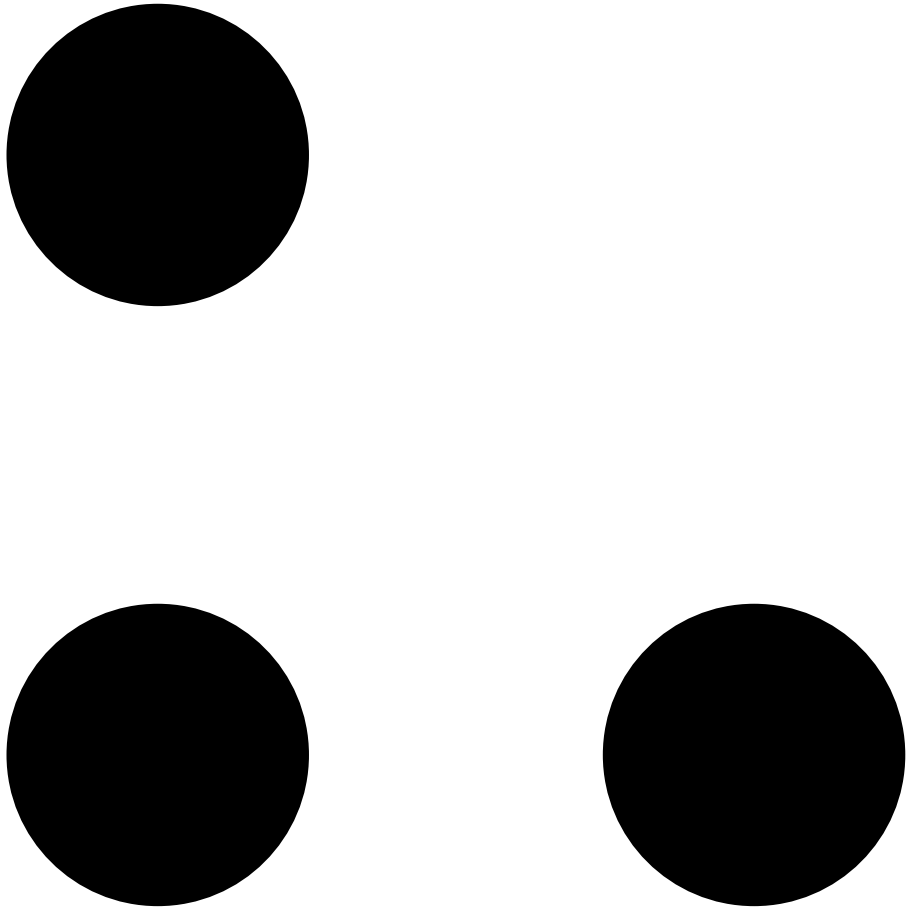
Subitising

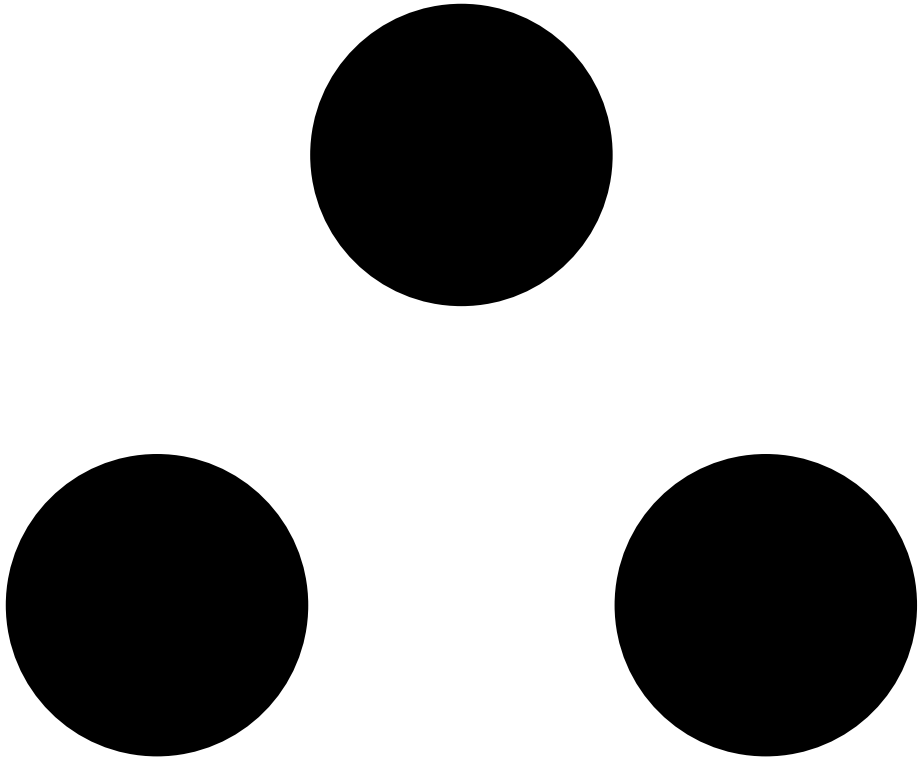
The way of recognising the quantity of something, without counting.

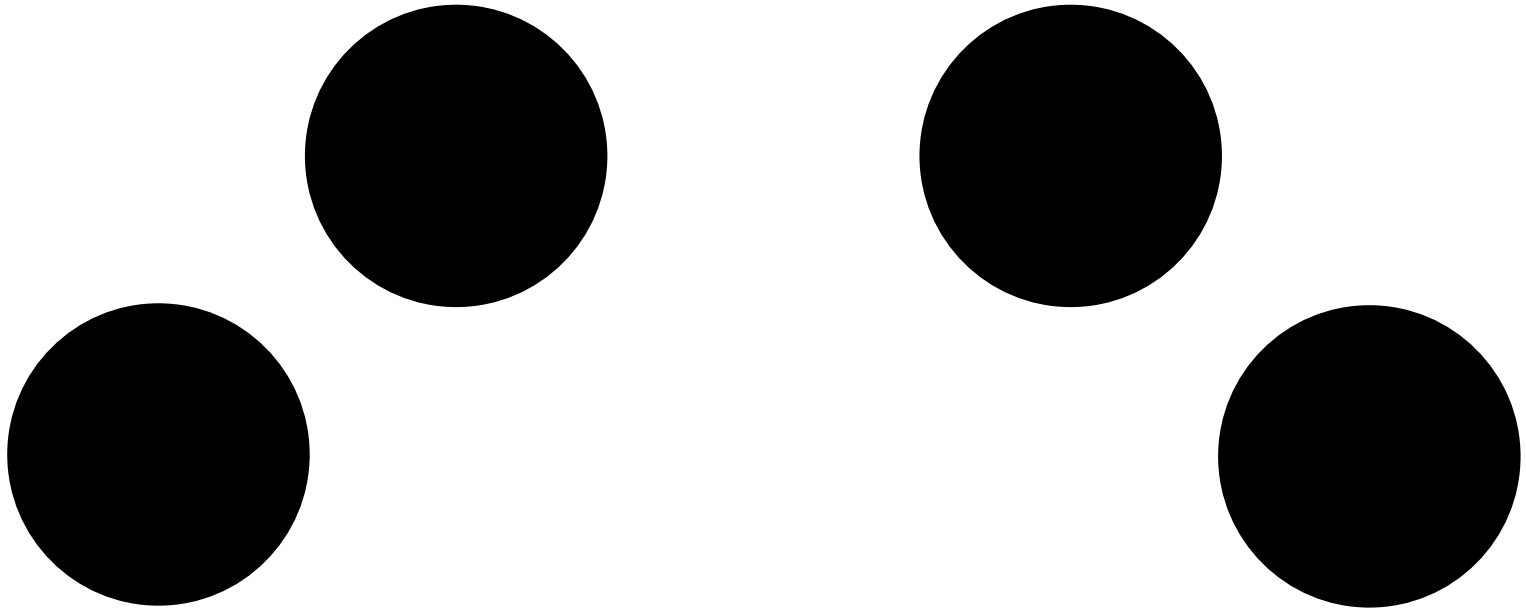


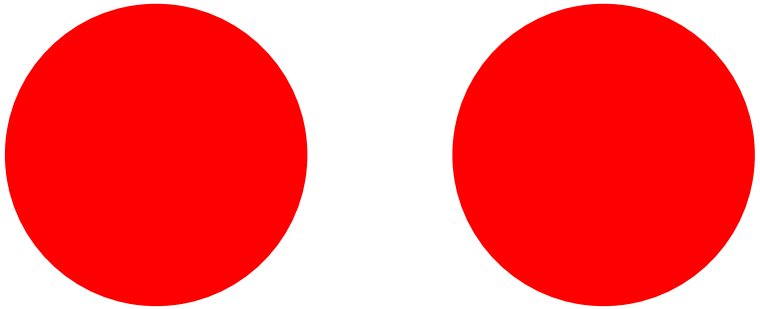


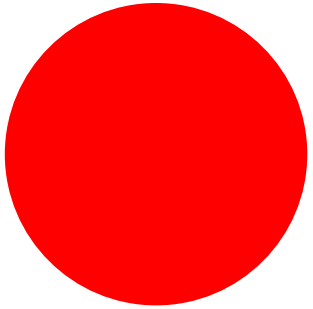


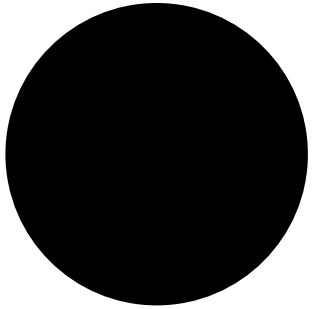


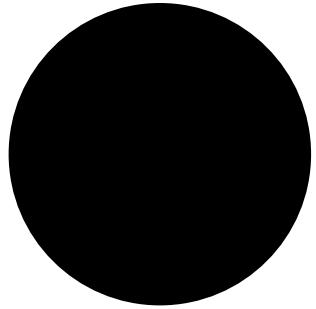


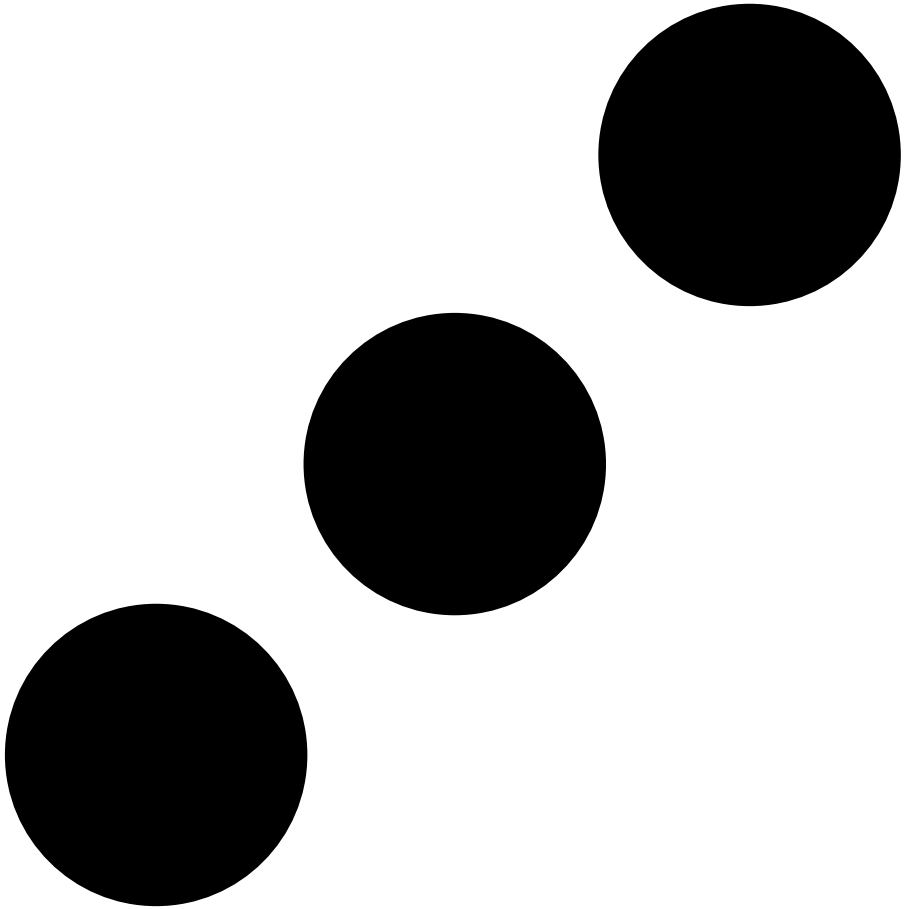


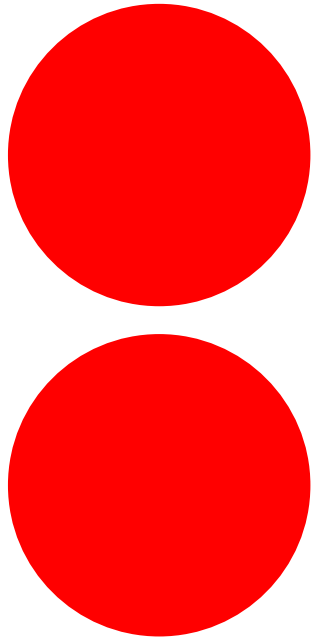




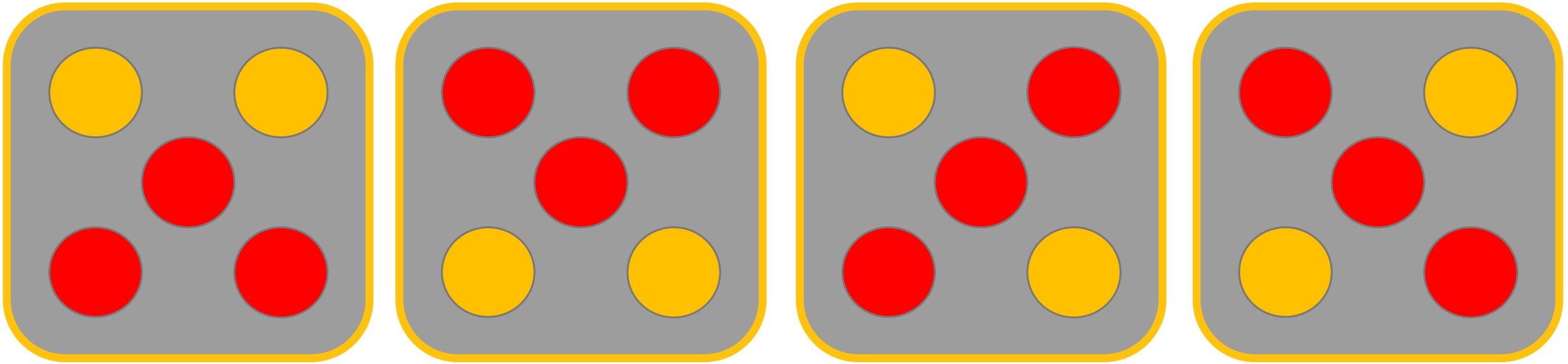








What is the same? What is different?
Which pictures are most similar?

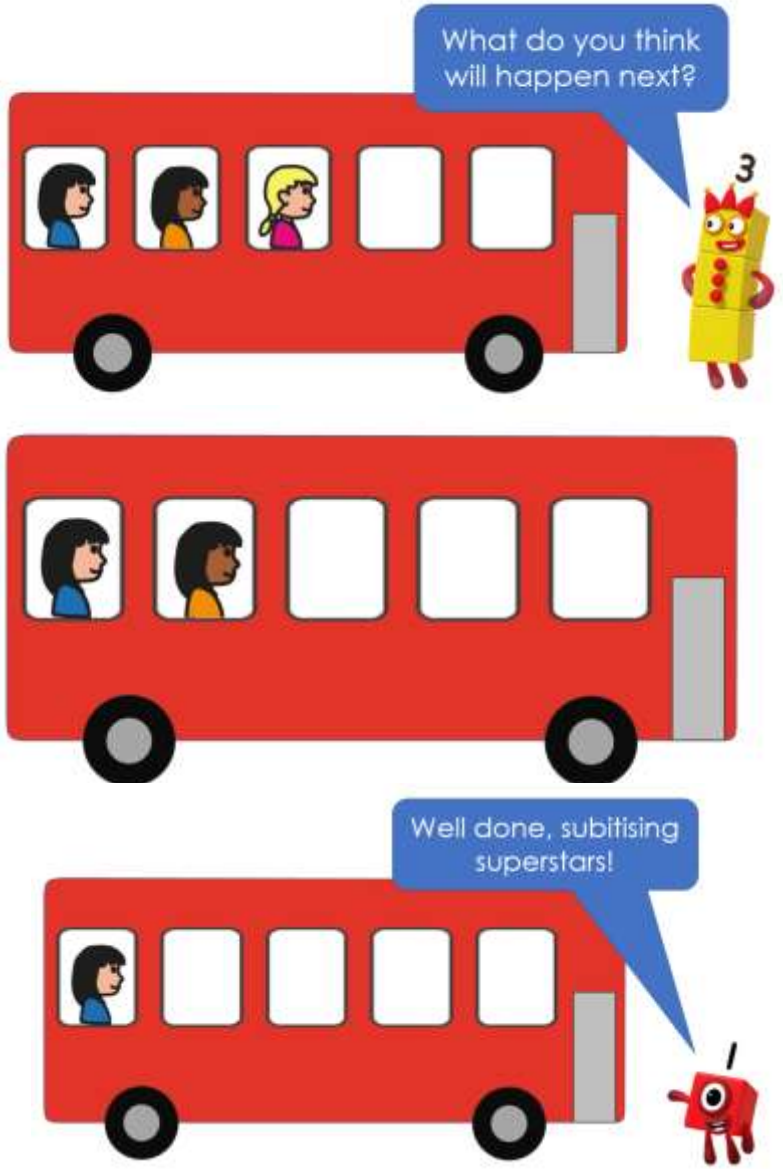


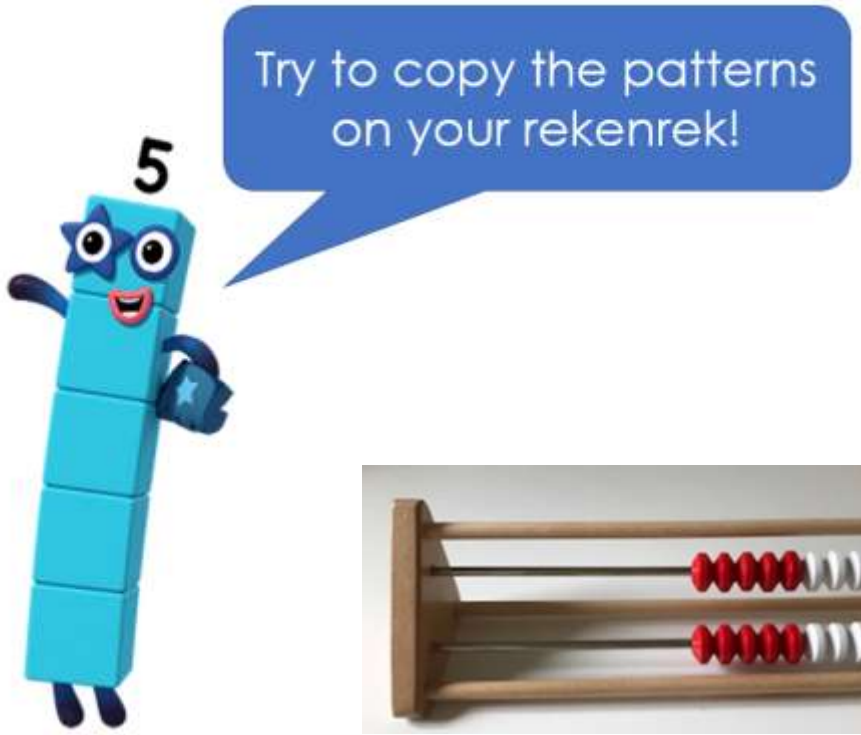
Mastering Early Number

Rekenrek

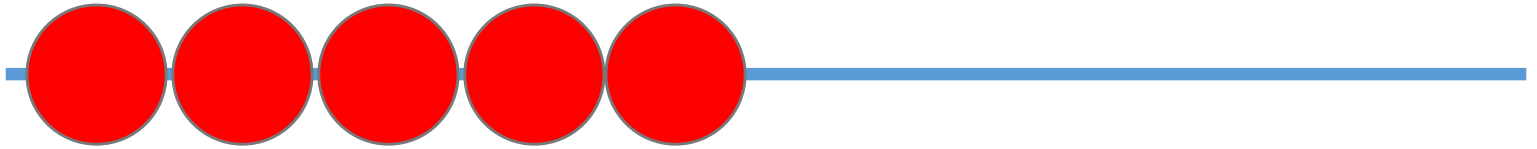
- Exposes mathematical structure for all children
- It highlights the 5 and 10
- Children can ‘see’ relationships
- Encourages children to be mathematically observant
- It encourages subitising

Rekenrek

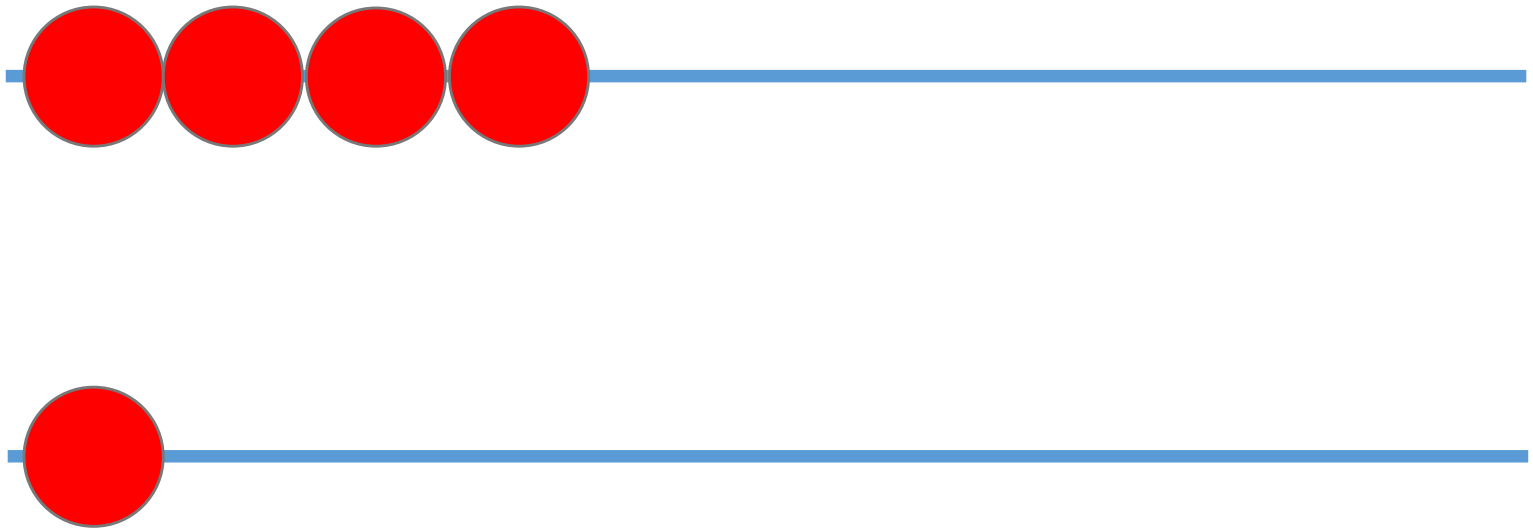

What do you think will happen next?
3
Well done, subitising superstars!


Try to copy the patterns on your rekenrek!
5

Can you work systematically to show all the ways to make 5?



How many on the bottom row to make 5?



_____ and _____ make 5.

For each expression, show 1 number on the top row and 1 number on the bottom row of your rekenrek.

$4 < 7$ $7 < 9$

$7 > 4$ $9 > 7$

_____ is greater than _____ ;
_____ is less than _____ .

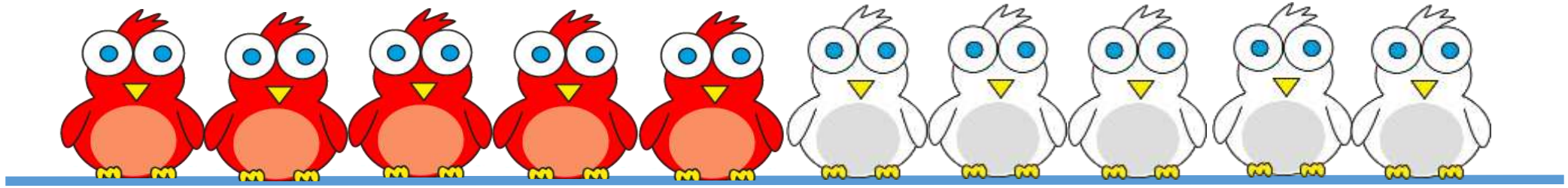
True or false? Convince me!

$$8 > 4$$

True or false? Convince me!

$$9 > 5 + 4$$

Show on your rekenrek and your fingers HOW MANY MORE birds are needed to make 12

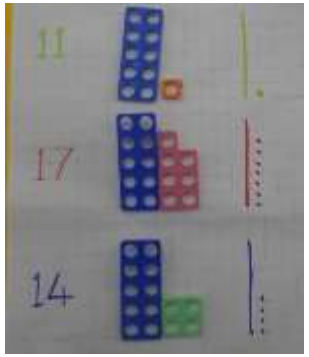


_____ needs _____ to make 10;
10 needs _____ to make _____ ;
so, _____ needs _____ to make _____ .

Place Value

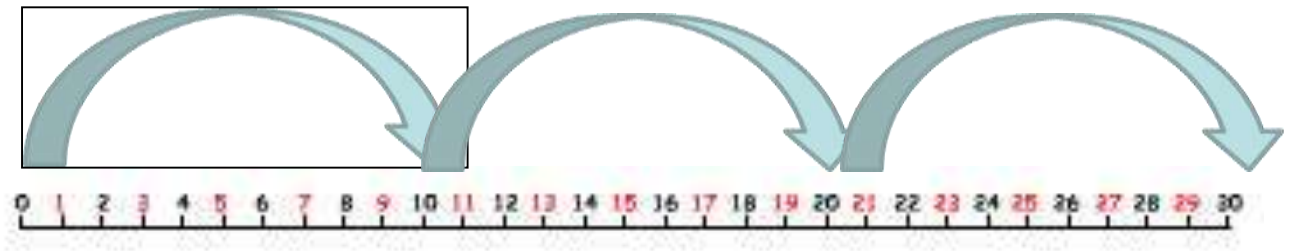
Early Years

- Matching
- Identifying
- Grouping



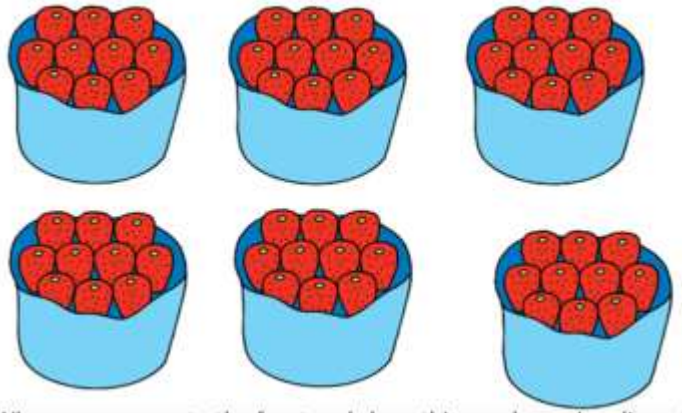
Years One and Two

- Partitioning
- Place value
- Use and apply this knowledge to problem solve.



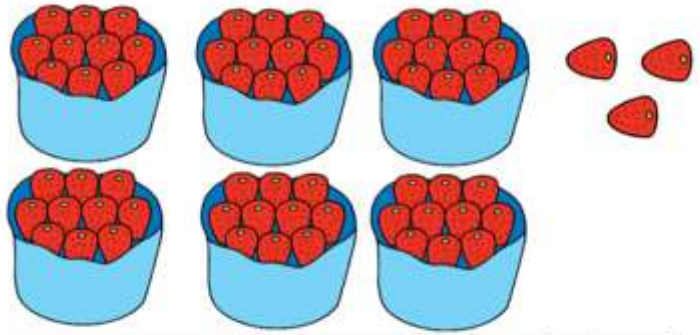
Place value

How many strawberries did I buy?



Who can come up to the front and show this number using dienes?

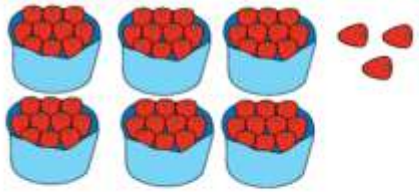
What if I bought three more strawberries?



How could we write this as a calculation?

Key maths sentence:

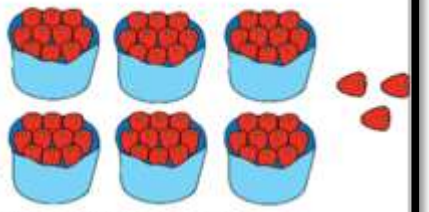
"63 is 60 and 3, which is six tens and three ones."



Calculation:

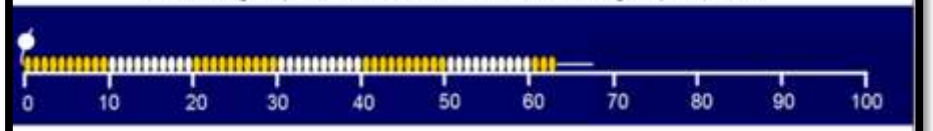
63 = 60 + 3

How can we show 63 strawberries on the number line?



How many jumps of ten do we need?
How many jumps of one do we need?

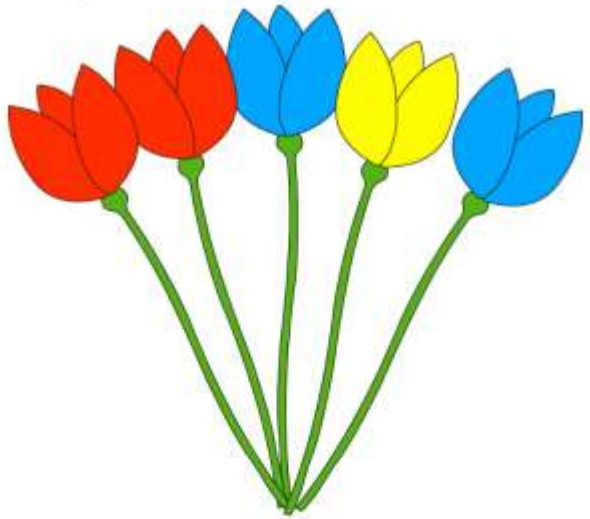
Draw the jumps of ten from 0-60, then three jumps of one.



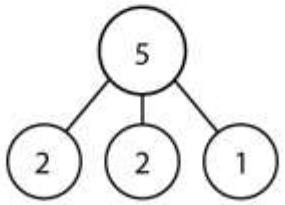
Now, draw jumps for this number.

Partitioning – the beginning

Partitioning into three parts:

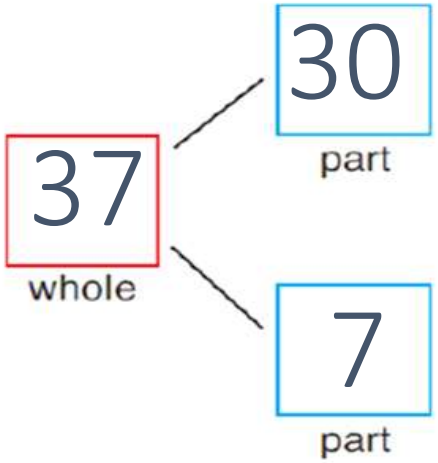


'There are five flowers. Two are red, two are blue and one is yellow.'



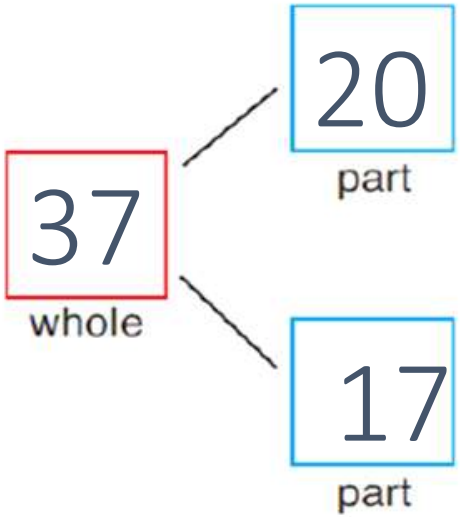
'Five is the whole; two is a part, two is a part and one is a part.'

Place value the next step….



3 tens

7 ones



2 tens

17 ones

What's the odd one out?
71, 77, 17, 70

Miss Platt bought 65 apples and Mr Ellimouni bought 59 apples.
Mr Ellimouni bought more apples.
True or False?

Number Bonds

Fluency

Reasoning

Problem solving

Concrete
Pictorial
Abstract

Reception

Children use quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing

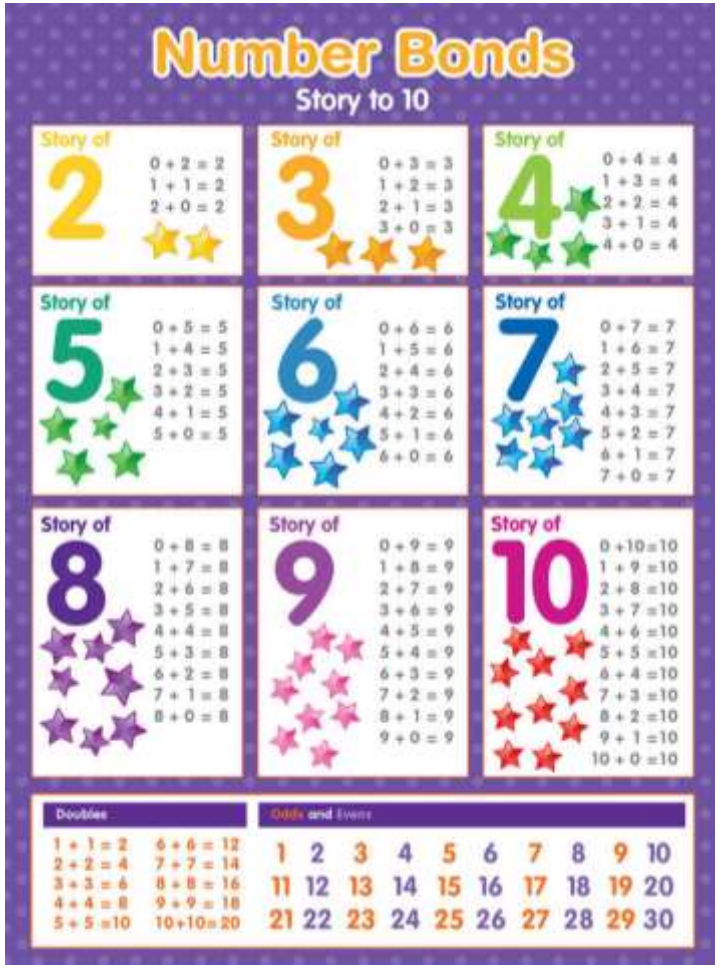
Year One

To show and use number bonds to 20. In addition and subtraction.

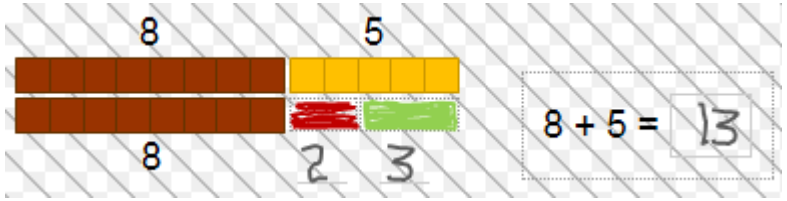
Year Two

I can recall and use + and - facts to 20 and use number facts to 100
To apply mental strategies to problems
To apply written strategies to problems

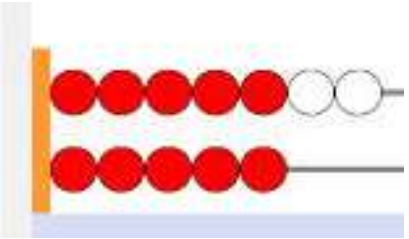
Number Bonds

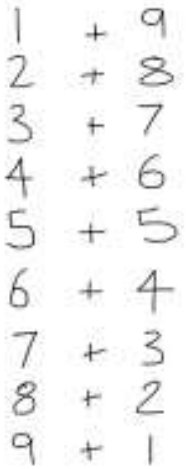


If I know 5+5=10…
What else do I know?



Memorising facts
Using facts
Patterns and connections
Generalising
'How many ways can you make 7?'





Prompting thinking everyday

- Show me…
- Here is the answer – what could the question have been?
- Odd one out
- Find the mistake and how it went wrong
- Can you see a pattern?
- True or false?
- Always true? Sometimes true? Never true?
  - Does an even number always end in 2?

Useful Links

NCETM National Centre for Excellence in the Teaching of Mathematics
https://www.ncetm.org.uk/

NCETM National Curriculum Glossary
https://www.ncetm.org.uk/media/hpihrj3s/national-curriculum-glossary.pdf

Nrich
http://nrich.maths.org/frontpage

I See Reasoning
https://www.iseemaths.com/i-see-reasoning-ks1/