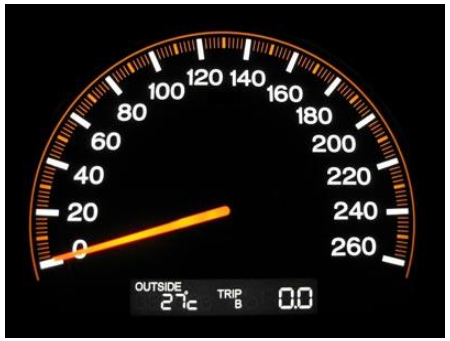
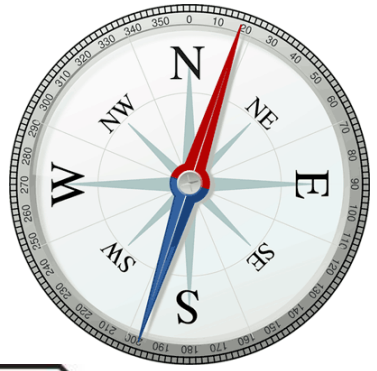
Making sense of maths
Parent Café

23RD JANUARY 2024

KETRINA HILL

Maths all around us





2017 DECEMBER

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
31					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

In this workshop, you will:

- Find out about some of the practical objects that we use in the classroom … and at home!
- Find out more about our working walls
- Find out how we make maths fun and challenging
- Find out about problem solving and reasoning
- Find out about Fluency Bee

How do objects help children to make sense of numbers?

Children need to handle, pick up and move practical objects when counting and calculating. This helps them to:

- see a number or problem in different ways
- make links between their learning in different areas in maths

Just as children can learn the word order of a nursery rhyme or poem, learning the order of numbers as words **one, two, three, four** is often just a memory game. Can they count out that amount of objects? Can they draw it? Can they talk about what the number means?

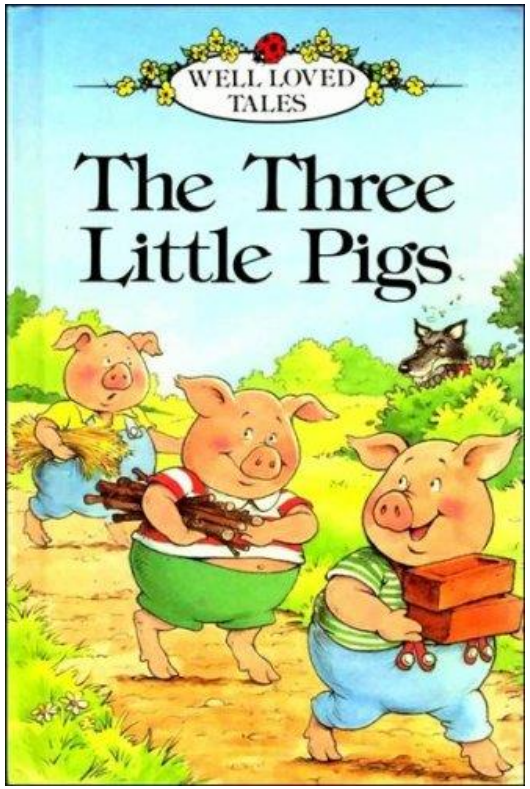
Objects are used by all children of all abilities at all stages of primary education.

What is a number?

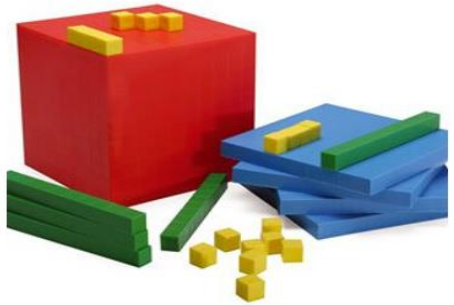
3 three

"1, 2, 3, 4"

As well as being able to say number names in the right order, read and write numbers, we want children to really understand what the number means. How many is 3? Do children see 3 objects 'in their head' when they hear the word three?



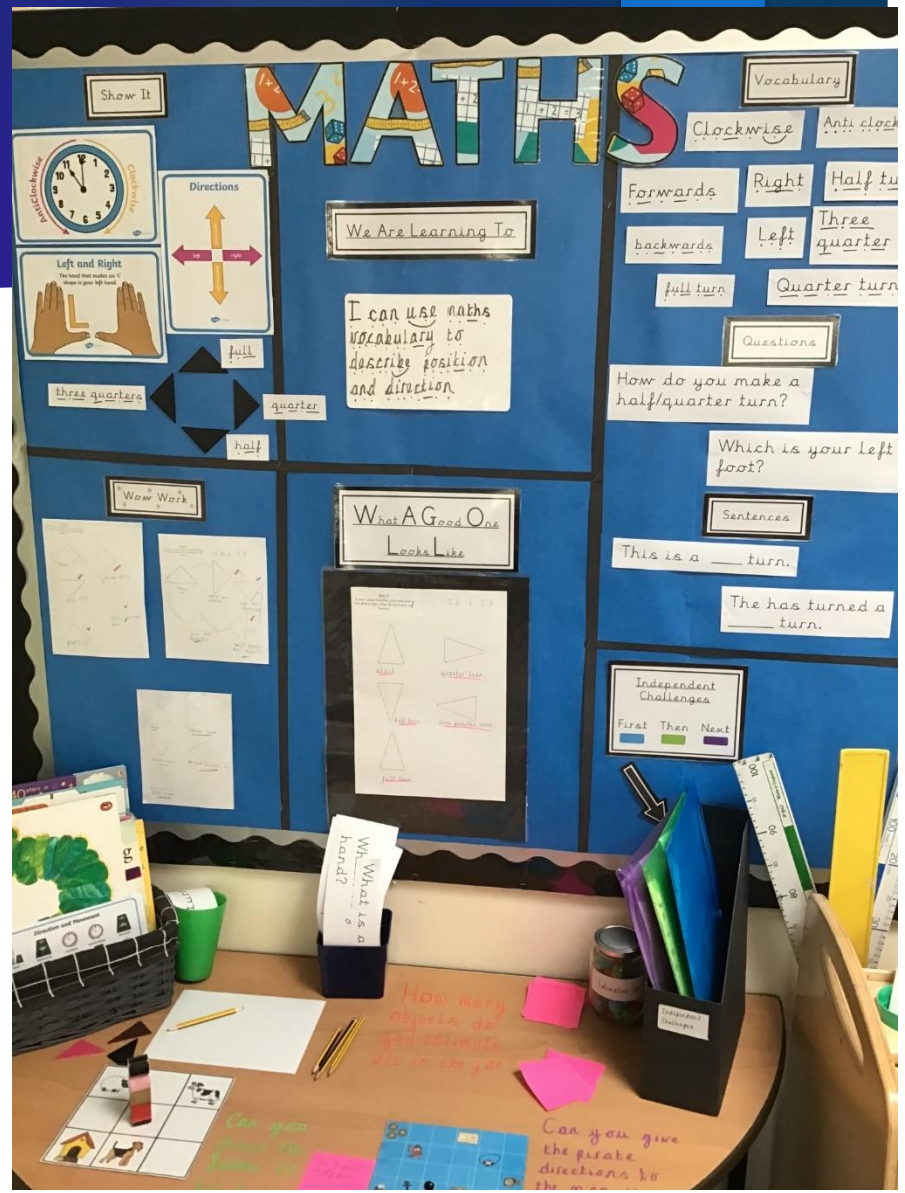
Practical objects in the classroom

		
Beadstring 20 and 100	Dienes (Also known as Base Ten)	Numicon Tiles or plates Pegs
		
Cubes Multilink Unifix	Counters	Chain links

Practical objects that you could use at home

Working walls

- Show it
- Vocabulary
- Questions
- Stem sentence
- WAGOLL (What a good one looked like)
- Wow work



Counting and Place Value

- Place value means that children understand the worth of each digit in a number

JARGON BUSTER!

Digit 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

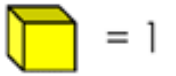
Number (numeral) 0, 1, 2, 3, 46, 54, 105, 275689…

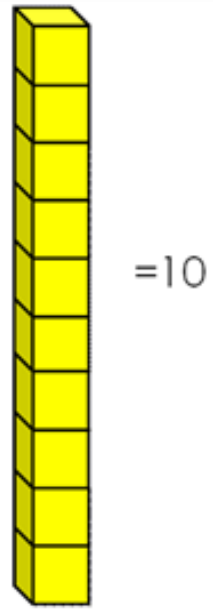
Number (word) zero, one, two, three, four etc.

Do children realise that the digit 3 in 13 is worth three ones? Or that the digit 3 in 31 is worth 3 tens?

Counting and Place Value

- Can you build the number 14 using dienes?
- Can you draw it?
- Can you say it?
- Can you write it?

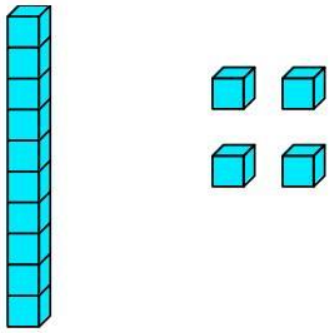




Can you find one more and one less? Can you find ten more and ten less?

Prove it!

14



"I have one ten and four ones."

14

fourteen

Counting and Place Value

13 Look at these numbers.

0	14	50	61

Write each number **once** to make these correct.

□ > □

□ > □

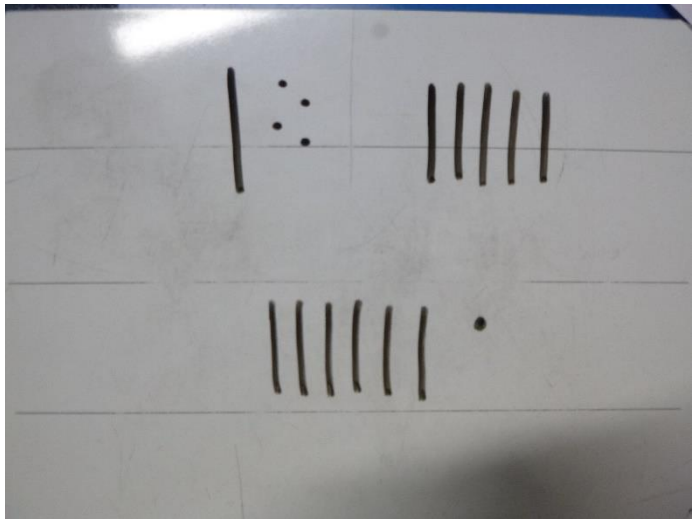
- Is there more than one way?
- How could you draw the dienes to help you?

50 > 14

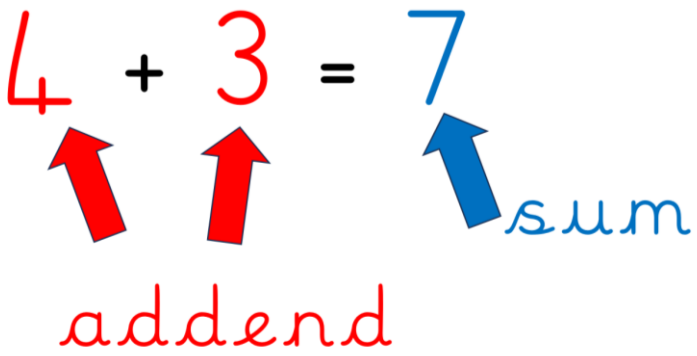
61 > 0

61 > 50

14 > 0



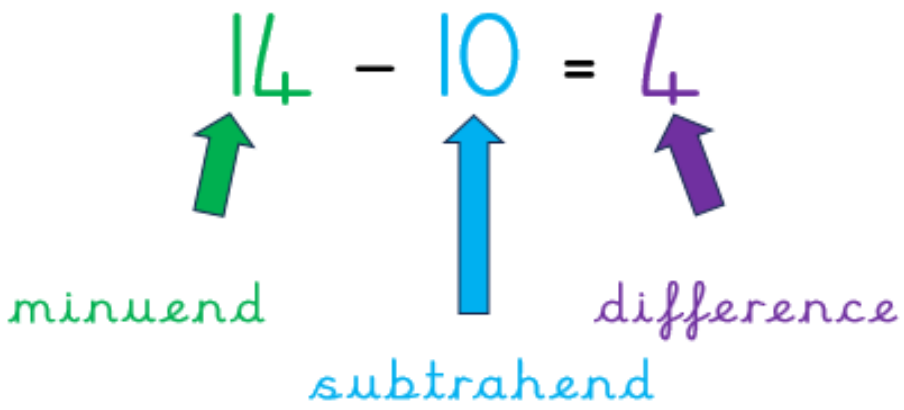
Vocabulary - addition



addend: the number being added, or added to, in an addition calculation

sum: how many altogether after adding.

Subtraction



minuend: the whole, the number being subtracted from.

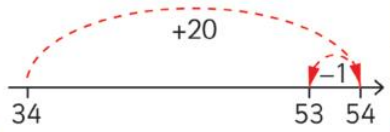
subtrahend: the number being subtracted from the minuend (or whole)

difference: the amount or quantity by which one thing is different to another

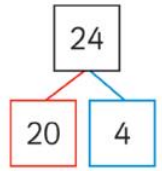
Key Mathematical vocabulary

Terms to describe strategies for mental or written calculations

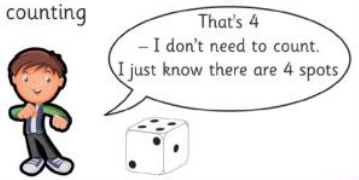
compensation: a mental calculation strategy in which a number is rounded to the nearest 10 to make the calculation easier, and the amount rounded up or down is compensated for at the end, for example 34 + 19, (34 + 20) – 1



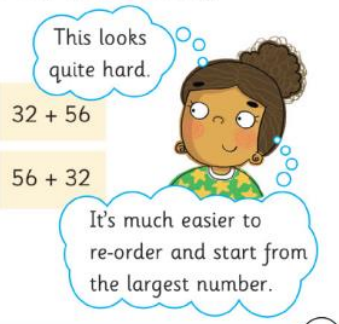
partition: split a number into 2 or more parts (often into 10s and 1s)



subitise: know how many without counting



reorder: put numbers in a different order to help with calculating



Other useful mathematical vocabulary terms

Year 1 definition:

commutative: addition is commutative. It does not matter which order the addends are added in, the sum will always be the same

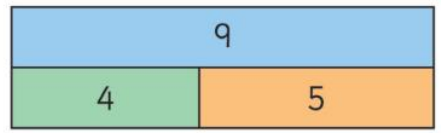
7 + 3 = 10
3 + 7 = 10

Year 2 definition:

commutative: law for addition and multiplication that means the numbers can be swapped around without changing the answer

5 + 3 = 8 is the same as 3 + 5 = 8

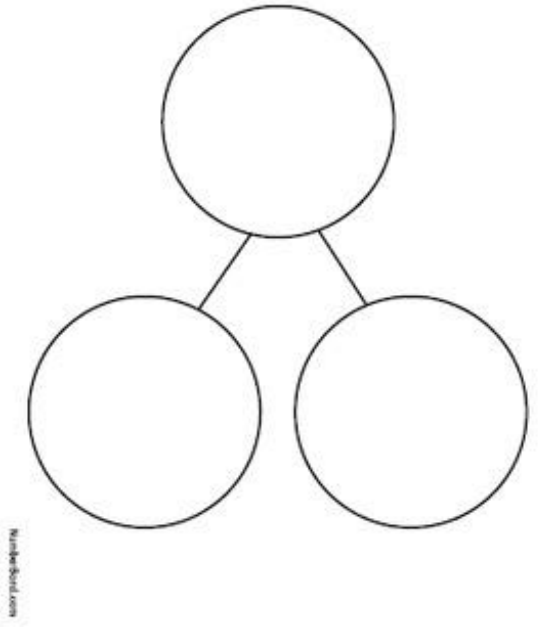
bar model: a diagram to show how wholes are partitioned into parts



inverse: The operation which reverses another operation. Addition is the inverse of subtraction, doubling is the inverse of halving.

12 – 4 = 8
8 + 4 = 12

Addition and Subtraction



Let's try this…

14 + 5 =

Can you build it using small objects?

How would we draw it on a part-whole model?

Can you say it?

Can you write it? How else can you write it?

Now you know that, what else do you know? You know that 19 – 14 = 5

Objects help the children to check and avoid errors.

14 + 5 = 19 so 5 + 14 = 19. 14 – 5 = 19. Number sense tells you this is not possible.

Addition and Subtraction

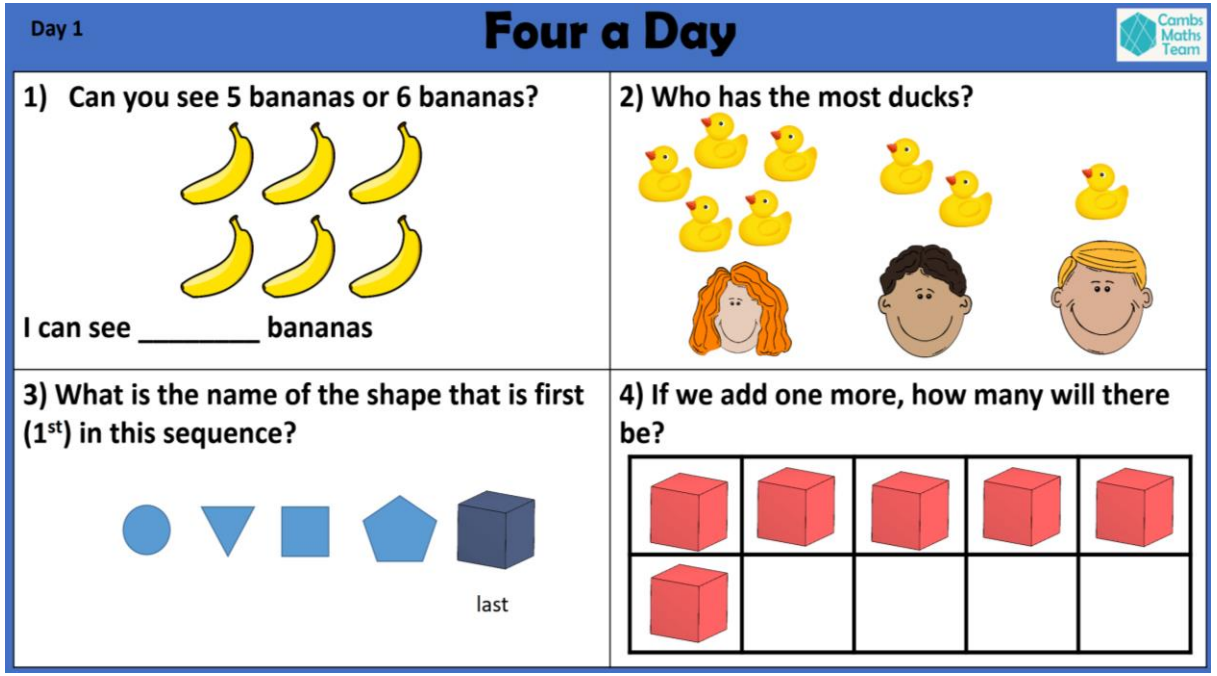
- Can you draw it?
- Can you say it?

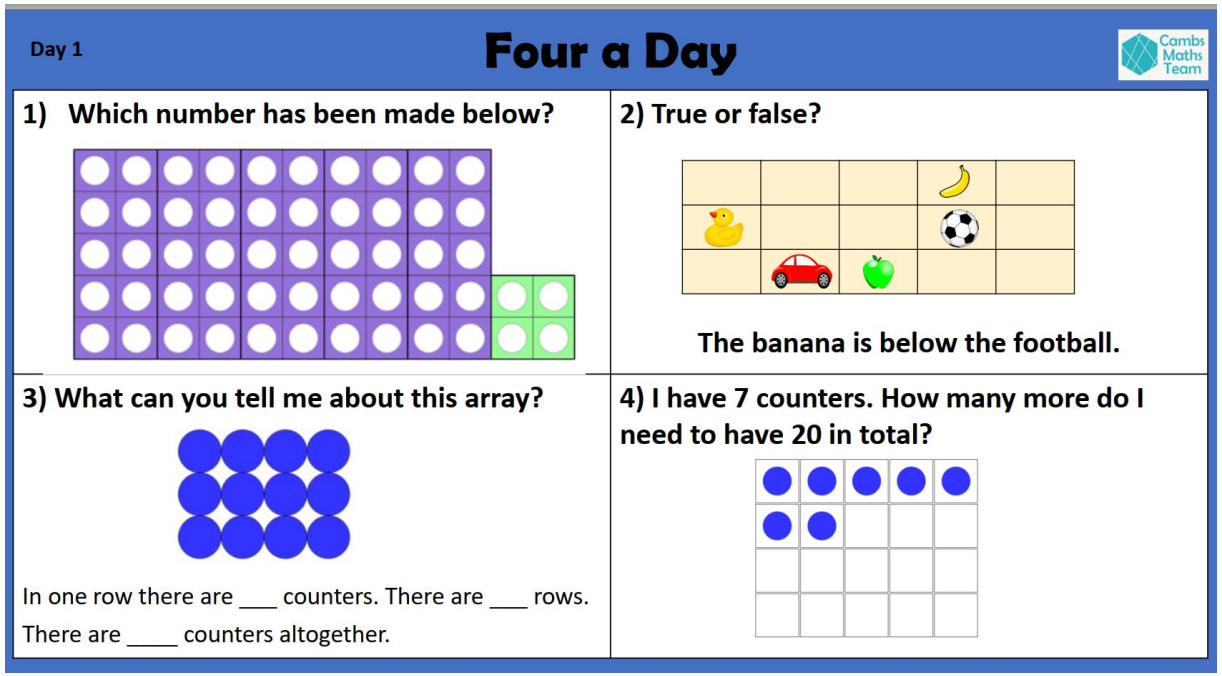
23 Write the missing number to make this number sentence correct.

$$9 + 7 - \square = 12$$

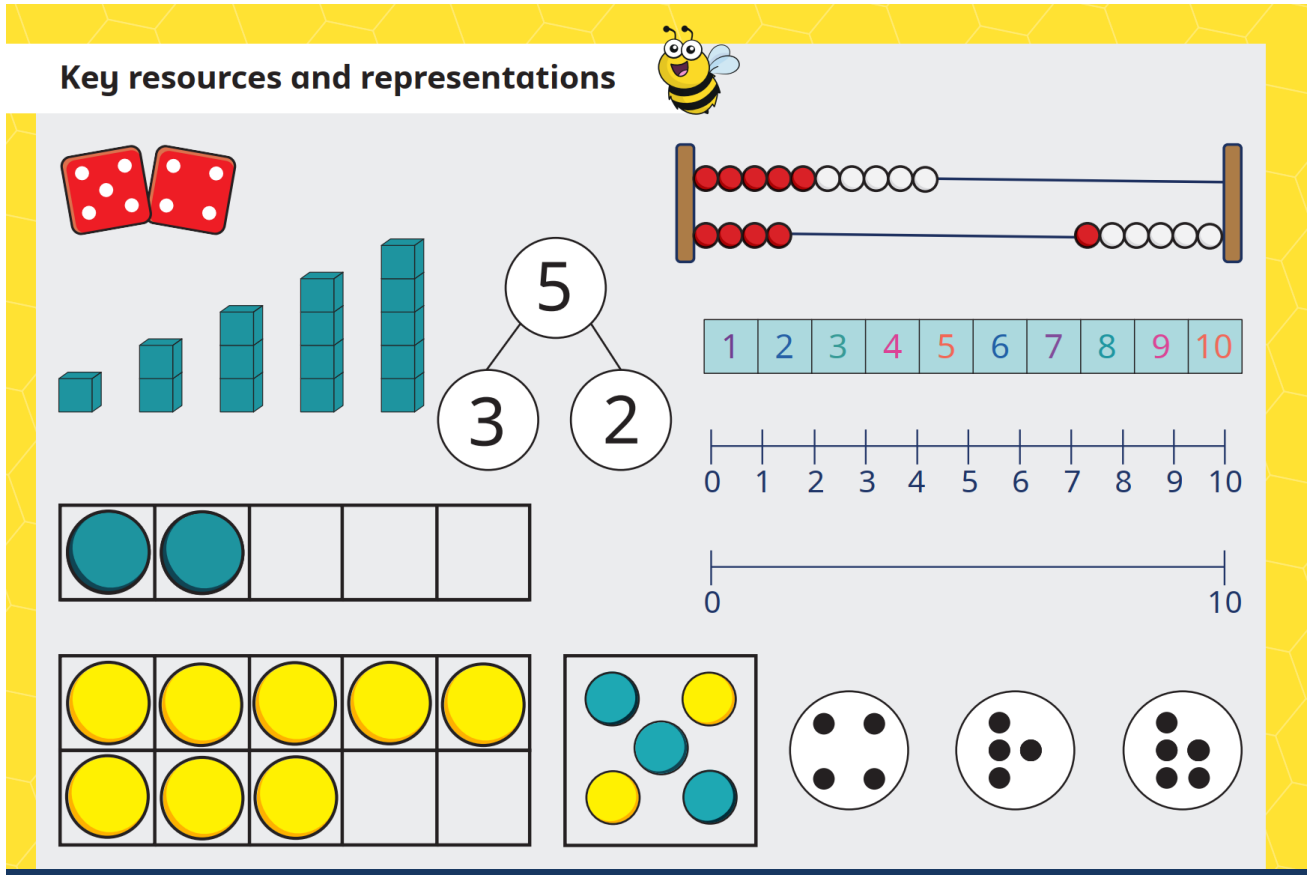
4 a day

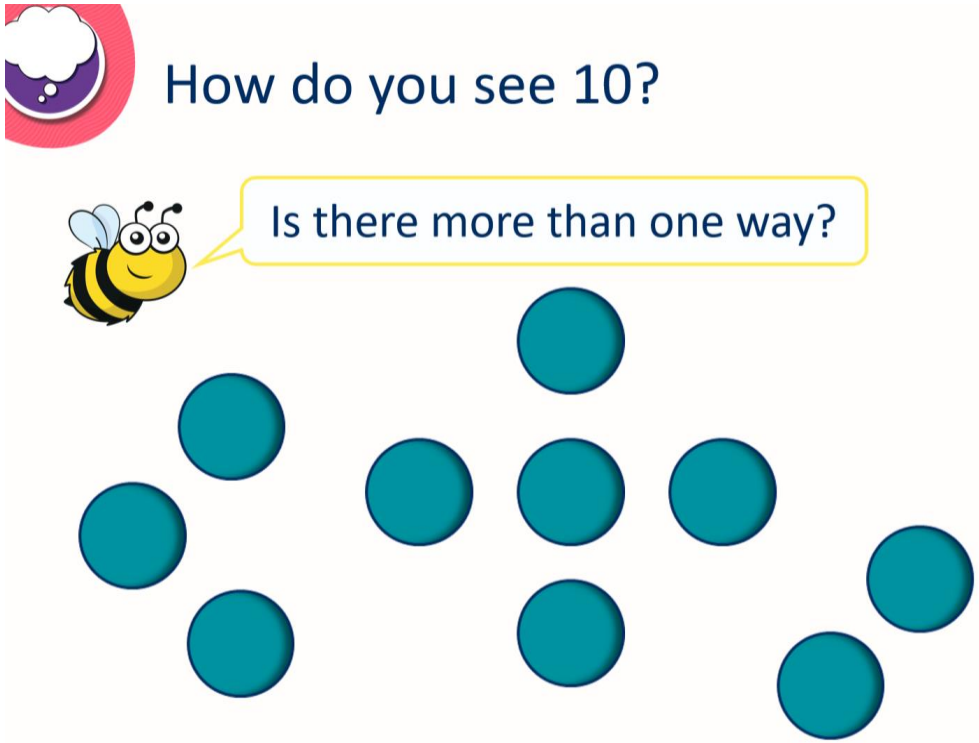
- 4 quick problems everyday to recap and practice skills





Fluency Bee


Key resources and representations
5
3
2
1 2 3 4 5 6 7 8 9 10
0 1 2 3 4 5 6 7 8 9 10
0
10


How do you see 10?
Is there more than one way?

Problem solving and reasoning

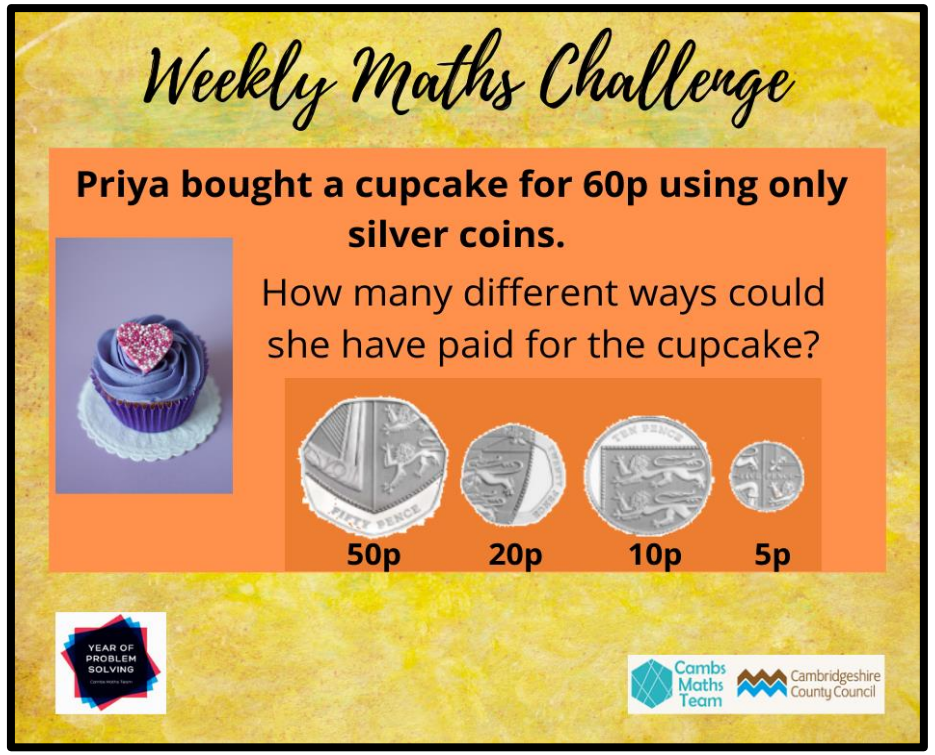
- Allows children to apply and explain their skills to different situations and scenarios

Write <, > or = to complete the number sentences.

double 6 ◯ 6 + 7

double 9 ◯ 9 + 8

9 + 8 ◯ double 8



Problem solving Challenge

Challenge

Weekly Maths Challenge

You take these five cards from a pack of playing cards and decide to practise adding the numbers on them.
You can add two, three, four or five of the numbers together each time.

How many **different totals** can you make?
What is the **lowest** possible total?
What is the **highest** possible total?

YEAR OF PROBLEM SOLVING

Cambs Maths Team

Cambridgeshire County Council

Weekly Maths Challenge

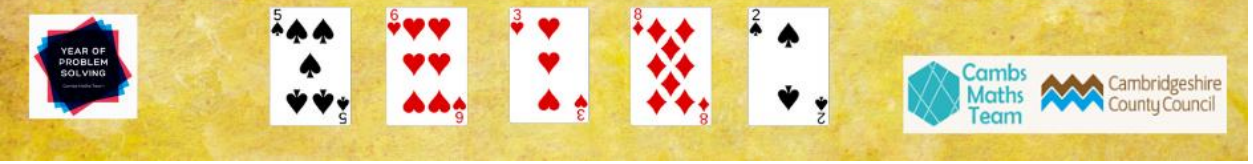
How many of these totals did you find?

Two cards:

5 + 6 = **11** 5 + 3 = **8** 5 + 8 = **13** 5 + 2 = **7**
6 + 3 = **9** 6 + 8 = **14** 6 + 2 = **8**
3 + 8 = **11** 3 + 2 = **5**
8 + 2 = **10**

Three cards:

5 + 6 + 3 = **14** 5 + 6 + 8 = **19** 5 + 6 + 2 = **13**
5 + 3 + 8 = **16** 5 + 3 + 2 = **10**
5 + 8 + 2 = **15**
6 + 3 + 8 = **17** 6 + 3 + 2 = **11** 6 + 8 + 2 = **16**
3 + 8 + 2 = **13**



Weekly Maths Challenge

How many of these totals did you find?

Four cards:

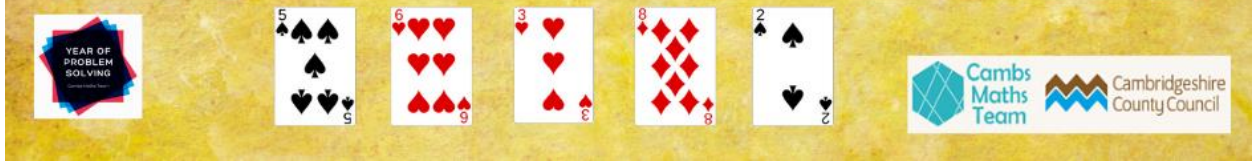
5 + 6 + 3 + 8 = **22** 5 + 6 + 3 + 2 = **16** 5 + 6 + 8 + 2 = **21**
5 + 3 + 8 + 2 = **18**
6 + 3 + 8 + 2 = **19**

Five cards:

5 + 6 + 3 + 8 + 2 = **24**

The repeated totals are in red.

There are 16 <u>different</u> totals.



<u>Solution Prompts</u>

How did your pupils get on?
Did they work systematically?
What did they notice?
How would they approach a similar problem in the future?
What strategies did they use when adding? Did they have any ideas for further investigations?

Thank you for coming!

- National Numeracy Parent toolkit has a wealth of tips and advice for parents

https://www.nationalnumeracy.org.uk/helping-children-maths/family-maths-toolkit

- Oxford Owl includes a range of activities, top tips and eBooks to help your child with their maths at home

https://home.oxfordowl.co.uk/maths/

- Nrich. A range of maths games, problems and articles on all areas of maths

https://nrich.maths.org/parents/primary

Thank you for coming!

List of websites for children

http://www.amathsdictionaryforkids.com/
https://www.bbc.co.uk/bitesize/subjects/zjxhfg8
https://ictgames.com/mobilePage/index.html
https://ilovemathsgames.com/
https://mathsisfun.com/
https://mathszone.co.uk/
https://multiplication.com/
https://www.primarygames.com/math/
https://www.primaryhomeworkhelp.co.uk/maths/
https://www.topmarks.co.uk/