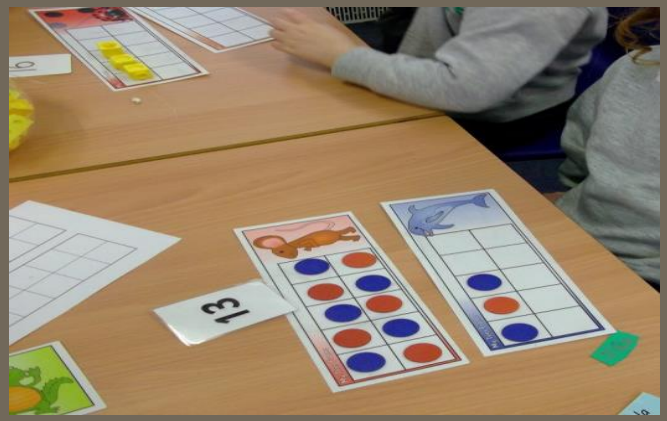
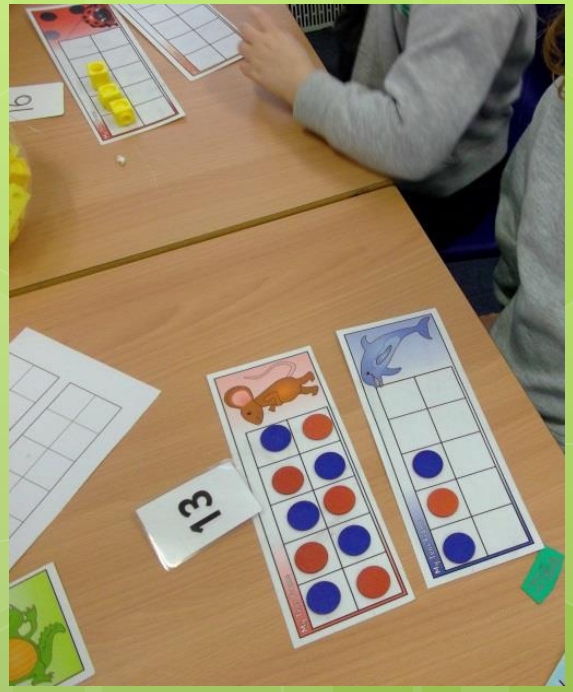


MATHS

Grow, Learn, Believe, Achieve

Aims

- To help you understand how maths is taught at Milford
- To share some of the activities that we do in school
- To provide ideas on how you can support your child at home



Grow, Learn, Believe, Achieve

Nearly half of 50

'My aunt was 24 last year'

24

14 + 10

Christmas Eve

Approximate weight in grams of a slice of bread

Where have you seen....?

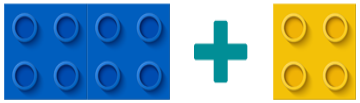
What do you know about....?

How many different ways can you make....?

Can you show me....?

Our teaching approach - CPA

Concrete



Includes manipulatives, measuring tools, or other objects that children can handle

Pictoral

Includes drawings, diagrams, charts or graphs that children can relate back to the concrete objects

Abstract

$2 + 1 = 3$

Symbolic representations such as numerals, letters, number sentences

THE CONCRETE STEP OF CPA

Concrete is the "doing" stage

The CPA approach brings concepts to life by allowing children to experience and handle physical (concrete) objects. With the CPA approach, every abstract concept is first introduced using physical, interactive concrete materials.

For example, if a problem involves adding pieces of fruit, children can first handle actual fruit. From there, they can progress to handling abstract counters or cubes which represent the fruit.

CONCRETE

Counting resources

Numicon

THE PICTORIAL STEP OF CPA

Pictorial is the "seeing" stage

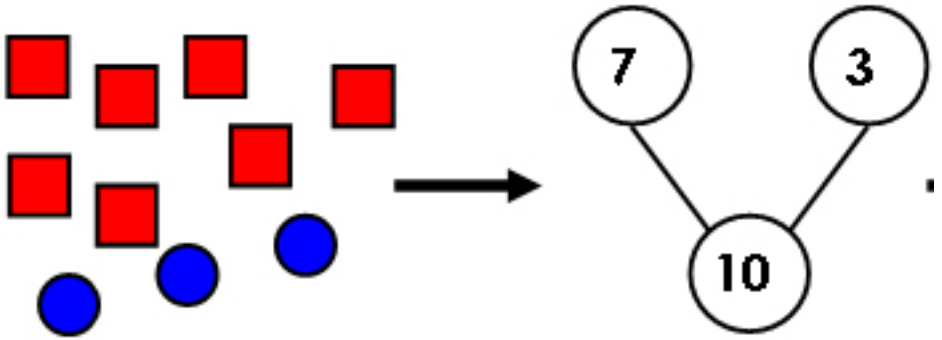
Visual representations of concrete objects are used to model problems.

This stage encourages children to make a mental connection between the physical object they just handled and the abstract pictures, diagrams or models that represent the objects from the problem.

Building or drawing a model makes it easier for children to grasp difficult abstract concepts (for example, fractions). Simply put, it helps students visualise abstract problems and make them more accessible.

PICTORIAL

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



THE ABSTRACT STEP OF CPA

Abstract is the "symbolic" stage

Children use abstract symbols to model problems.

Children will not progress to this stage until they have demonstrated that they have a solid understanding of the concrete and pictorial stages of the problem.

The abstract stage involves the teacher introducing abstract concepts, for example, mathematical symbols.

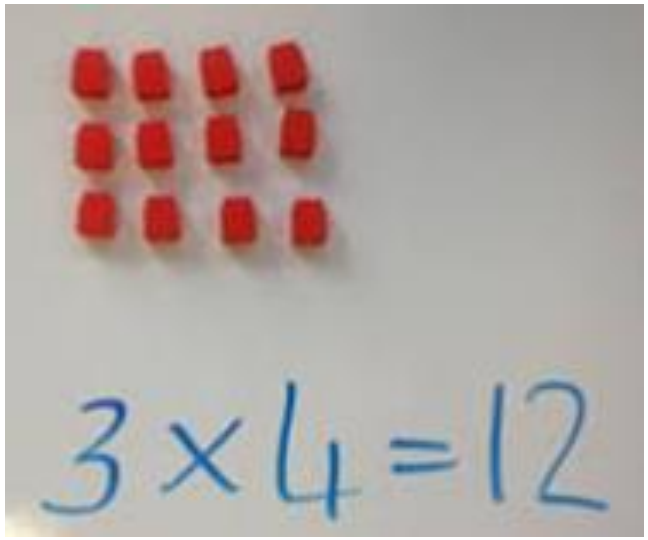
ABSTRACT

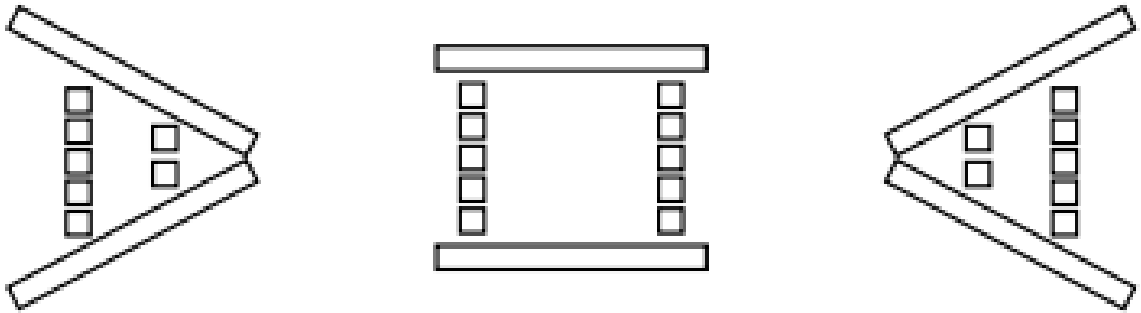
8 + 2 = 10

2 + 8 =10

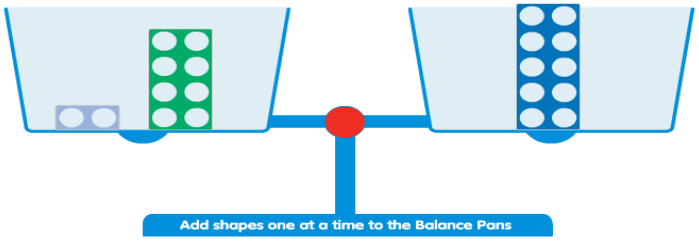
10 = 8 + 2

10 = 2 + 8





The equals sign

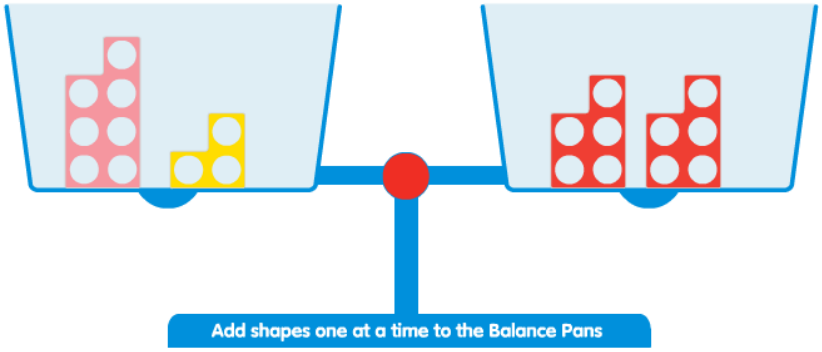


8 + 2 = 10
10 = 8 + 2

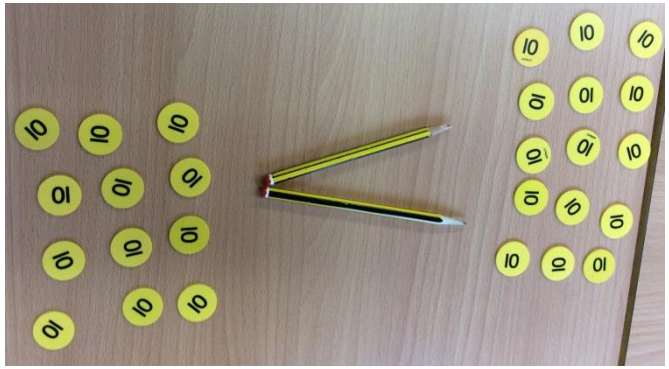
equals total the same as

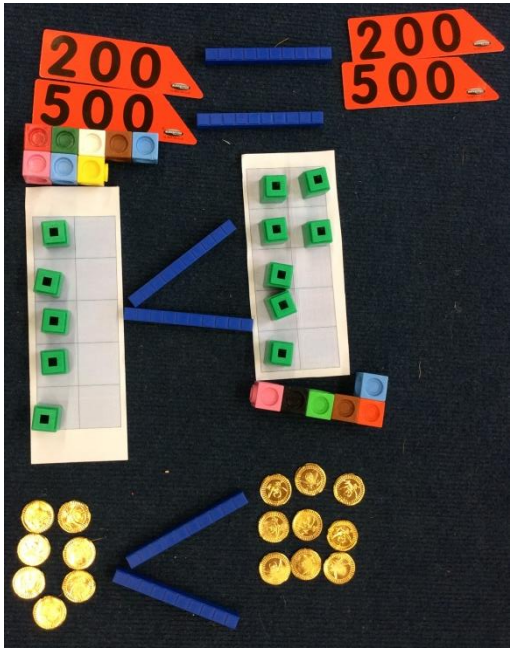
is equal to altogether

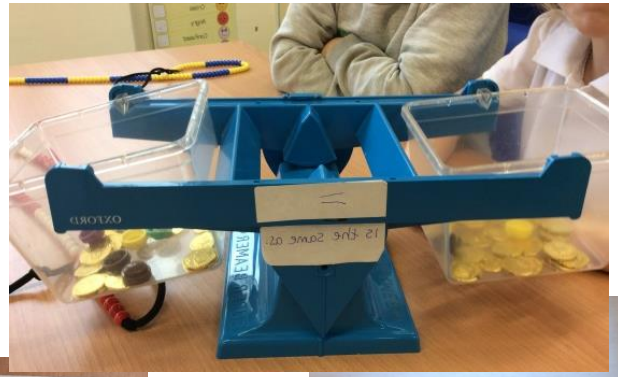
7 + 3 = 5 + 5
5 + 5 = 3 + 7

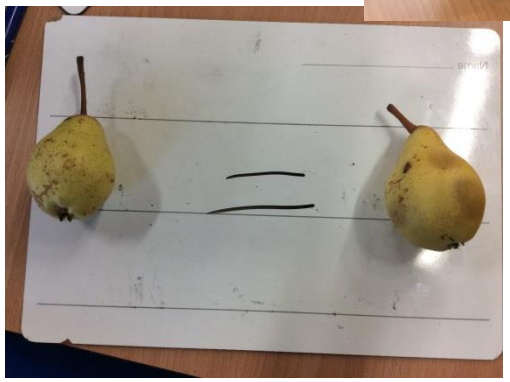


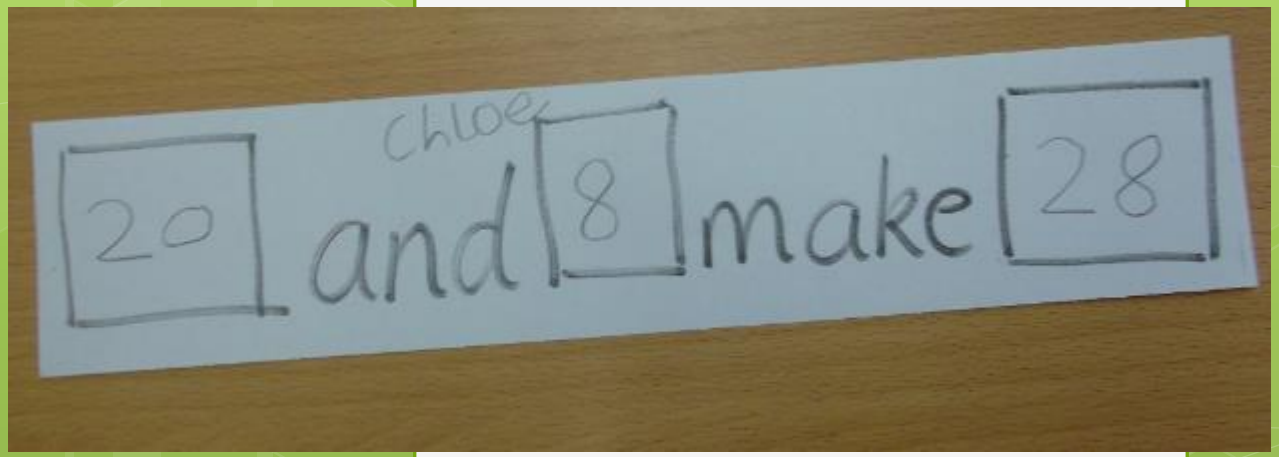
Visualising equality and inequality











Grow, Learn, Believe, Achieve

Ways to help children to develop a positive 'can do' attitude towards maths

- Believe all children can learn maths to a high level
- Show your child that you believe in their ability to learn by what you say and do –the power of saying "yet"
- Praise effort and strategies
- We will ensure at school that we provide challenging learning opportunities and opportunities for children to make mistakes - MARVELLOUS MISTAKES
- Celebrate mistakes, new learning and each child's progress

What does a successful mathematician look like?

A child who:

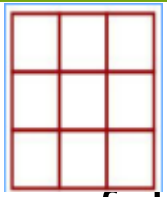
- takes risks
- asks questions and explores alternative solutions without fear of being wrong
- enjoys exploring and applying mathematical concepts to understand and solve problems
- explains their thinking and presenting their solutions to others in a variety of ways
- reasons logically and creatively through discussion of mathematical ideas and concepts
- becomes a fluent, flexible thinker able to see and make connections

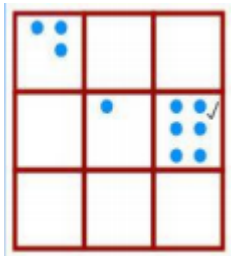
Talking about our mathematics

- Why do you think that …?
- Can you explain why that is right?
- How did you reach that conclusion?
- How is that possible?
- Can you show me …?
- Is there another way …?
- What explanation do you think is best …?
- Have you tried all the possible cases?

Once pupils' thinking is secure, then 'What if …? questions can be used to promote new ideas and to extend the scope or context of the problem.

Dotty 6

You need a partner, a 1 - 6 dice and a grid like this 

- Take turns to throw the dice and draw that number of dots in one of the boxes on the grid. (suggest you each have a different colour of pencil)
- Put all of your dots in one of the boxes. You can't split them up and you can't have more than six dots in a box.
- When a box is full, you could put a tick in the corner like this: 
- Keep going until there are three ticks in a row or column or diagonal. The winner is the person who puts the last tick.

Consider what maths skills you are using when playing this game.

How could you adapt this game?

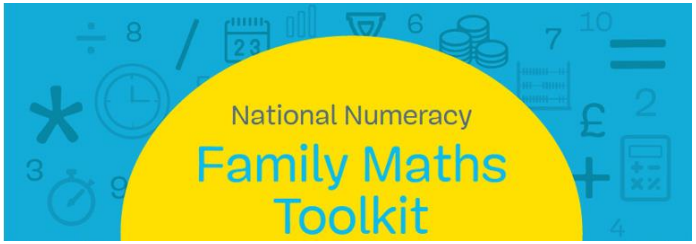
- Play until all the boxes are full.
- Use a 1-9 dice so each box has 9 dots
- Start with six counters in each box and take away the number on the dice
- Use a bigger grid
- You could make the winner the first to complete a whole row that adds to a certain total (e.g. 15)

Questions to promote thinking

- How many more dots do you need to fill that rectangle?
- I think you need five more dots to fill that rectangle – am I right?
- How many rectangles have you filled so far?
- If you threw a three, which rectangle would you put the dots in?
- I've thrown this ... which rectangle could that go in? I'm wondering what to do with this score. Can you help me?
- If I throw a six, how many spaces are left for me to put it in?

What can I do?

- Be positive about maths. Try not to say things like "I can’t do maths" or "I hated maths at school" - your child may start to think like that themselves.
- Point out the maths in everyday life. Include your child in activities involving numbers and measuring, such as shopping, cooking and travelling.
- Praise your child for effort rather than for being "clever". This shows them that by working hard they



A website full of ideas, resources and activities that can help children up to 13 years old explore maths in everyday life.

Any questions ?
Please do get in touch!