Maths at Horndale

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Aims of todays session

- To give you as parents/carers a better understanding of the way that we teach Maths at Horndale.
- To give you an insight into why we teach Maths in this way.
- To give you some ideas of how you can help your children at home.

Solve the calculation below

Use any of the resources that are on your table to solve the following calculation.

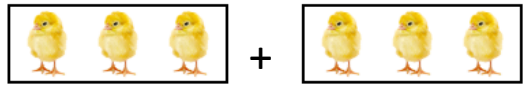
15 + 6 = 21

How did you do it? Explain to someone near you.

CPA Method

- At Horndale we follow the **CPA** Method of teaching calculation.
- **C** – Concrete

- **P** – Pictorial



- **A** – Abstract

6 + 3 = 9

- The **CPA** method involves, initially, using actual objects for children to add, subtract, multiply or divide. They then move on to using pictorial representations of the object, and finally, abstract symbols. (+ - x ÷ =)
- Children often find maths difficult because it is abstract. The **CPA** approach helps children learn new ideas and build on their existing knowledge by introducing abstract concepts in a more familiar and real life way.

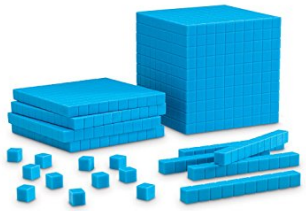
Concrete

- Concrete is the ‘doing’ stage, using actual objects to solve problems. For example:
- There are 8 flowers in the vase. Hannah has 2 flowers in her hand. How many flowers are there altogether?
- In this problem, the children might first handle actual flowers – the concrete stage – before progressing to handling counters or cubes (like numicon) which are used to represent the flowers.

Numicon

Counters

Multi-link cubes



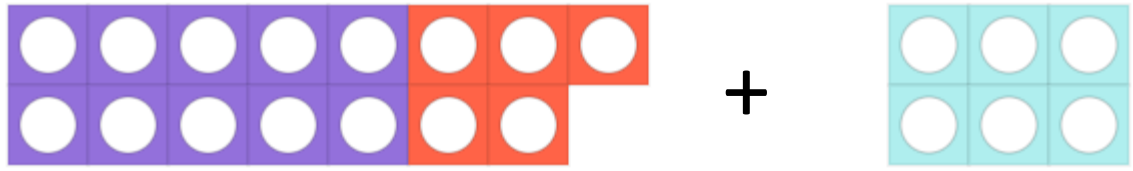
Base Ten

Now solve this calculation again using the concrete method …

- 15 + 6 =

How did you do it this time?

What did you use?



Pictorial

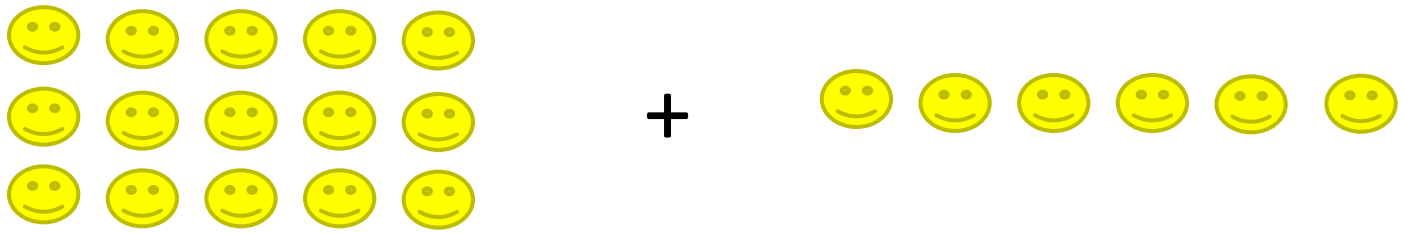
- Pictorial is the ‘seeing’ stage, using pictures or symbols of the objects involved in maths problems.
- Building or drawing a model makes it easier for children to grasp concepts they traditionally find more difficult, such as fractions, as it helps them visualise the problem and make it more accessible.

- E.g. 2 trucks drive into the carpark then another 2 trucks join them. How many trucks are there altogether?

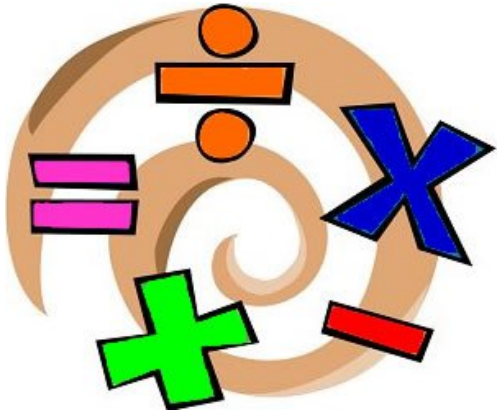
Now solve this calculation again using the pictorial method …

- 15 + 6 =

How did you do it this time?



Abstract



- Abstract is the ‘symbolic’ stage, where children are able to use abstract symbols to solve maths problems.
- Once a child has demonstrated that they have a solid understanding of the ‘concrete’ and ‘pictorial’ representations of the problem, the teacher can introduce the more ‘abstract’ concept, such as mathematical symbols.
- Children are introduced to the concept at a symbolic level, using only numbers and mathematical symbols, for example +, –, x, ÷ , = to indicate addition, subtraction, multiplication, or division.
- So, for the following problem:
- Jim has 12 cookies. Julie has 8 cookies. How many do they have altogether?
- Children at the abstract stage would be able to solve the problem by writing it out as 12 + 8 = 20.

Abstract addition and subtraction at Year 1

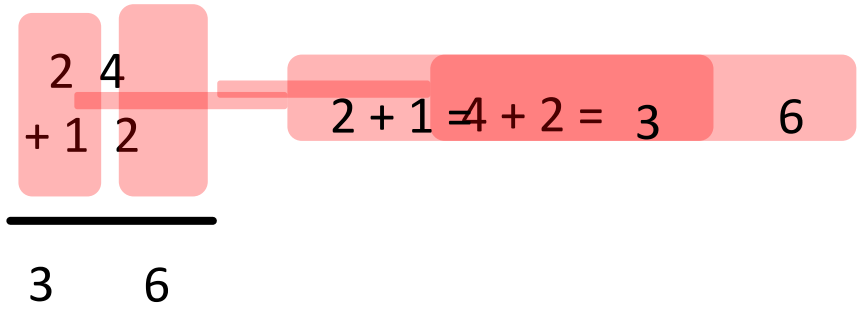
- 5 + 3 = 8

- Put the biggest number in your head (5)
- Count forwards (3) more
- The number you stop at is your answer

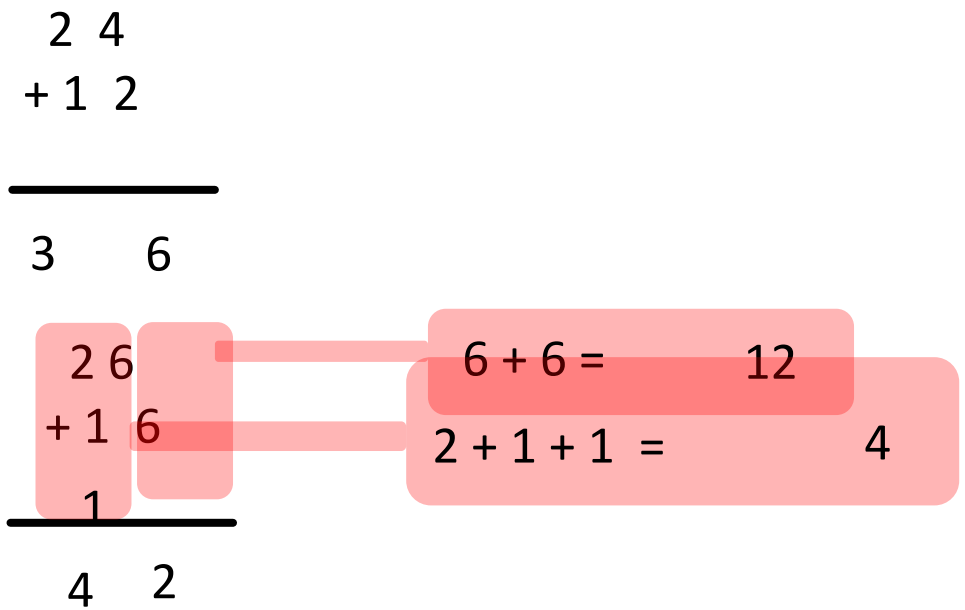
- 15 – 2 = 13

- Put the biggest number in your head (15)
- Count backwards (2) more
- The number you stop at is your answer

Abstract addition and subtraction at Year 2



Abstract addition and subtraction at Year 2



Abstract addition and subtraction at Year 2

$$\begin{array}{r} 24 \\ +\,12 \\ \hline 36 \end{array}$$

$$\begin{array}{r} 26 \\ +\,16 \\ \hline {\scriptstyle 1} \\ \hline 42 \end{array}$$

$$\begin{array}{r} 36 \\ -\,24 \\ \hline 12 \end{array}$$

6 - 4 = 2

3 - 2 = 1

Abstract addition and subtraction at Year 2

$$\begin{array}{r} 2\ 4 \\ +\ 1\ 2 \\ \hline 3\ \ 6 \end{array}$$

$$\begin{array}{r} 2\ \ 6 \\ +\ 1\ 6 \\ \hline 4\ \ 2 \end{array}$$

$$\begin{array}{r} 3\ \ 6 \\ -\ 2\ \ 4 \\ \hline 1\ \ 2 \end{array}$$

$$\begin{array}{r} 2\ \ 1 \\ 3\ \ 2 \\ -\ 1\ \ 7 \\ \hline 1\ \ 5 \end{array}$$

12 – 7 = x 5

2 - 1 = 1

Now solve this calculation again using the abstract method …

- 15 + 6 =

How did you do it this time?

$$\begin{array}{r} 1\ 5 \\ +\ 6 \\ \hline 2\ 1 \end{array}$$

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How can you help your child at home?

- Have a positive attitude towards Maths!
- Be patient with your child.
- Use Maths talk every day.
- Play Maths games.

Thank you for your time!

Any Questions?

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