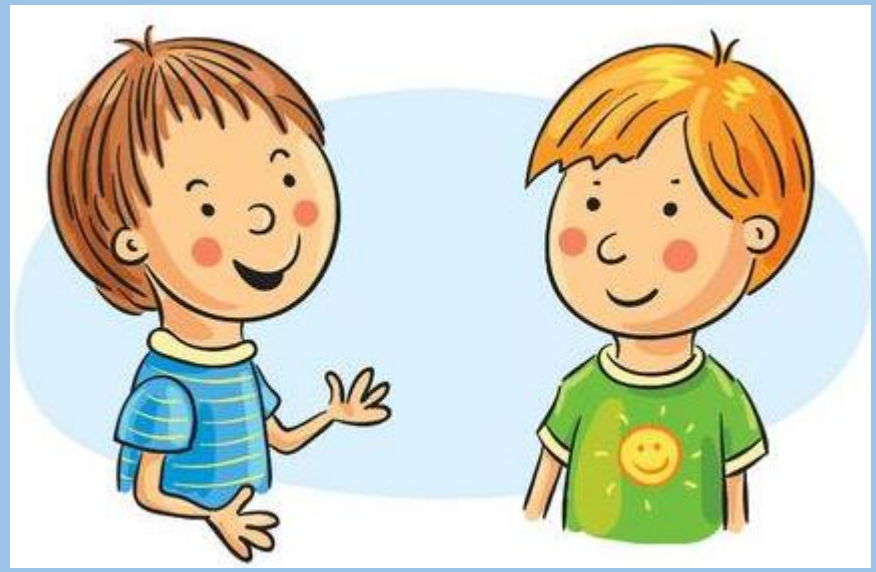
Developing Children's Language Proficiency Through **Teaching for Mastery**.



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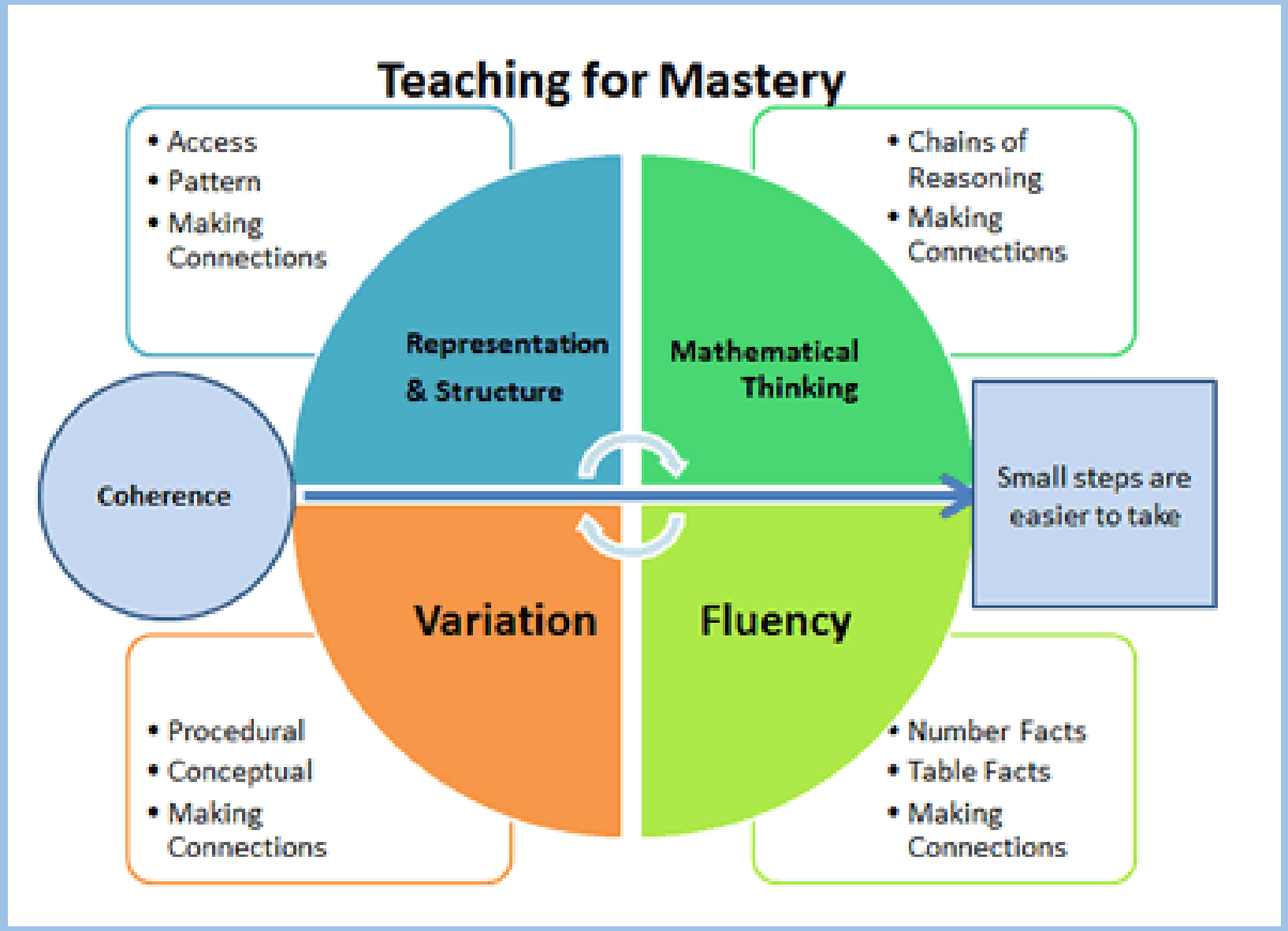
Teaching for Mastery
• Access
• Pattern
• Making Connections
• Chains of Reasoning
• Making Connections
Representation & Structure
Mathematical Thinking
Coherence
Small steps are easier to take
Variation
Fluency
• Procedural
• Conceptual
• Making Connections
• Number Facts
• Table Facts
• Making Connections

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National Centre for Excellence in the Teaching of Mathematics

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National Centre for Excellence in the Teaching of Mathematics

Do you think this mathematical vocabulary is appropriate for key stage 1? Why?

represent

factor

subtract

product

multiples

Aims of the session:

- to identify planning and teaching implications when supporting children to use correct mathematical vocabulary.
- to identify the impact on the children's understanding when using correct mathematical vocabulary.

The following clip is a Year 1 class. It is the second lesson out of 6.

What teaching strategies did you see?

What planning and teaching implications do you notice?

What impact did the vocabulary used, have on the children?

Anything else…

What planning and teaching implications do you notice?

What teaching strategies did you see?

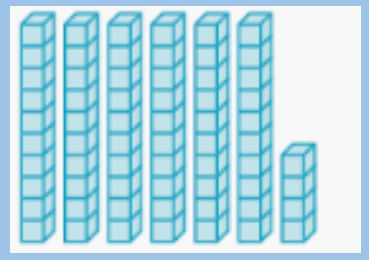
What impact did the vocabulary used, have on the children?

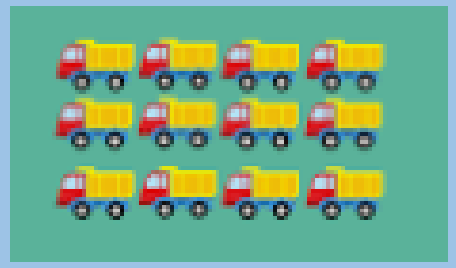
Anything else…

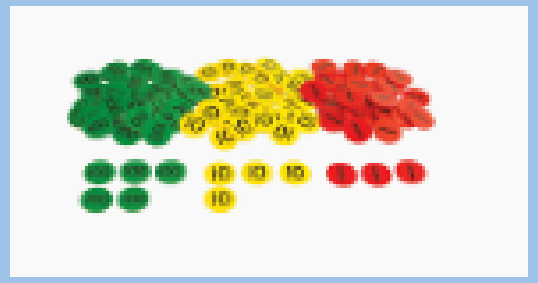
The importance of representing numbers.

CPA concrete/pictorial/ abstract – enables children to demonstrate and explain their thinking.

This then reduces their over reliance on words and also supports the use of the correct vocabulary.

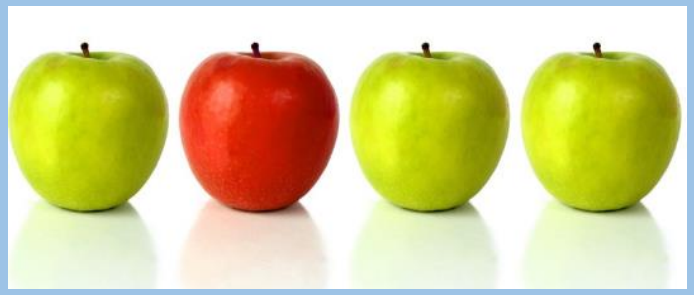


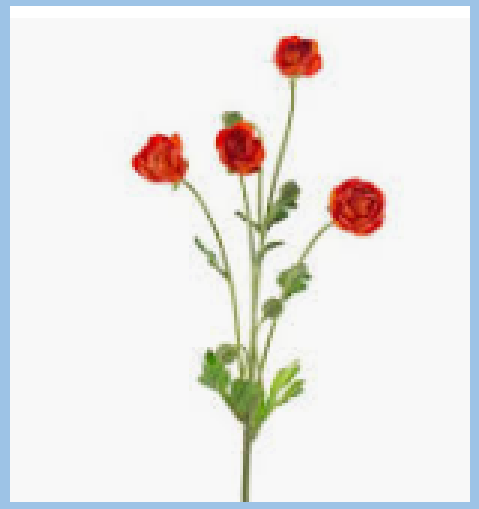




The use of **nouns**.

4 + 3 = 7





4kg +3kg = 7kg

Units

Less is more

Using only one calculation, when introducing new learning uncovers the concept and makes it explicit. Focus is not on the answer.

Children are able to internalise the language and make connections with the real world and their life experiences. Then use it correctly.

This allows all children to have a deeper understanding including SEND/EAL and non-EAL children.

The correct language and the deeper understanding allows children to reason and ‘grapple’ with the mathematics.

Answering in sentences

Clear modelling by the teacher and other children again and again.

High expectations for all children to answer in a sentence.

Stem sentences/ chants

All children can answer using planned stem sentence.

Chants – these are key to the children's understanding and are used by the children to scaffold their independent work too.

What is the ten before?
What is the ten after?
What is halfway between?
Which tens number is our number closest to?

The denominator is how many equal parts the whole has been cut into ___.

The numerator is how many equal parts of the whole there is ___ .

Task

Take a piece of paper.

Fold it.

Shade/show $\frac{1}{4}$

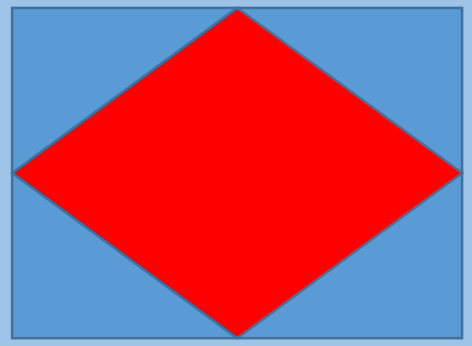
How do you know it's a quarter? Prove it.

The whole is cut into _____ equal parts and _____ of the parts is shaded.

Using the chant can you justify your choice?

Non Conceptual **Variation**

The red part is $\frac{1}{5}$, True or False?



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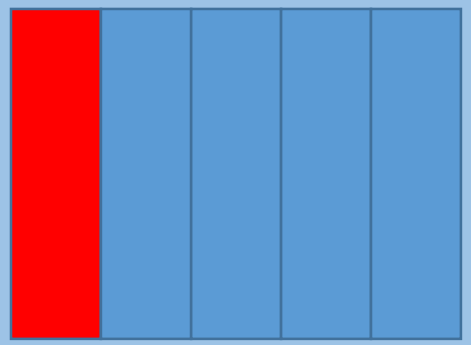

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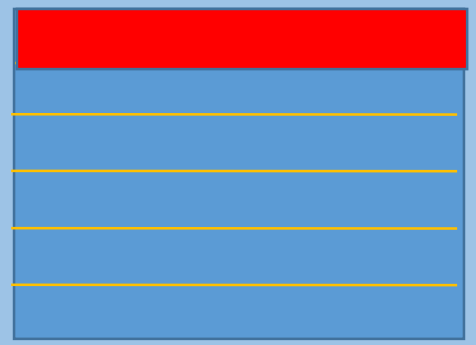

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What is the concept, what is not the concept?

$\frac{1}{6}$

Shanghai Teacher's Example

Year 2 mixed ability class.

Multiplication.

What examples of developing children's language can you see?

What is the impact of children using that language?

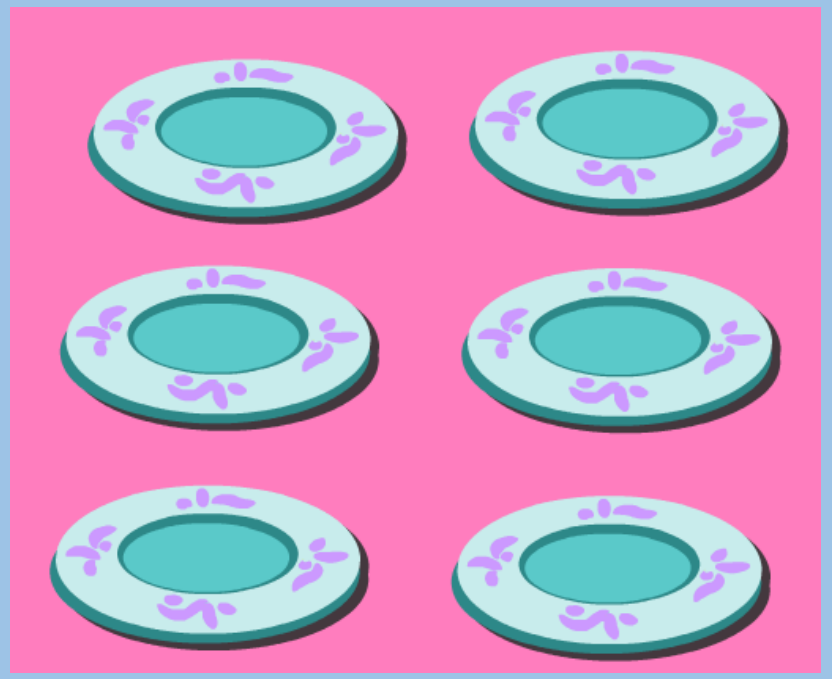
How many sausages can you see?

There are 5 groups of 4 .

5 fours

4+4+4+4+4=20

How many apples can you see?



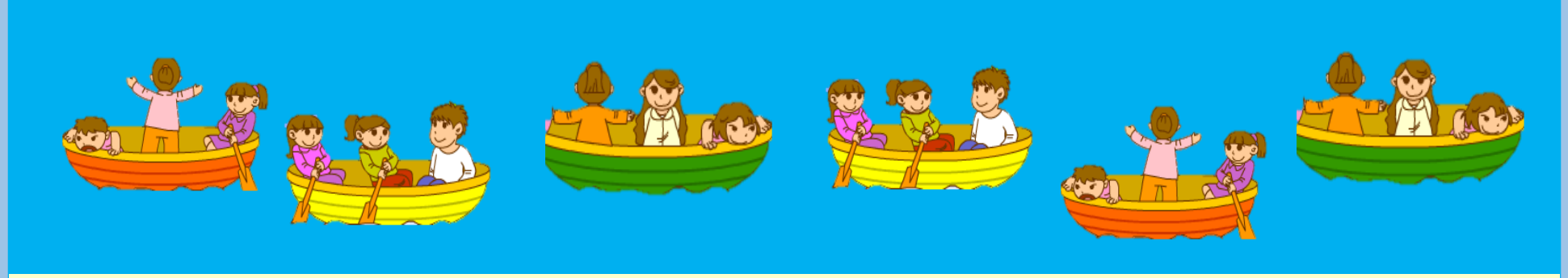
There are 6 groups in the picture.

There are 0 apples in each group.

6 groups of 0

6 zeros

0+0+0+0+0+0=0



Addition with the same number
—using **Multiplication** is more convenient.

6 threes $3+3+3+3+3+3=18$

multiplication

$6 \times 3 = 18$

factor factor product

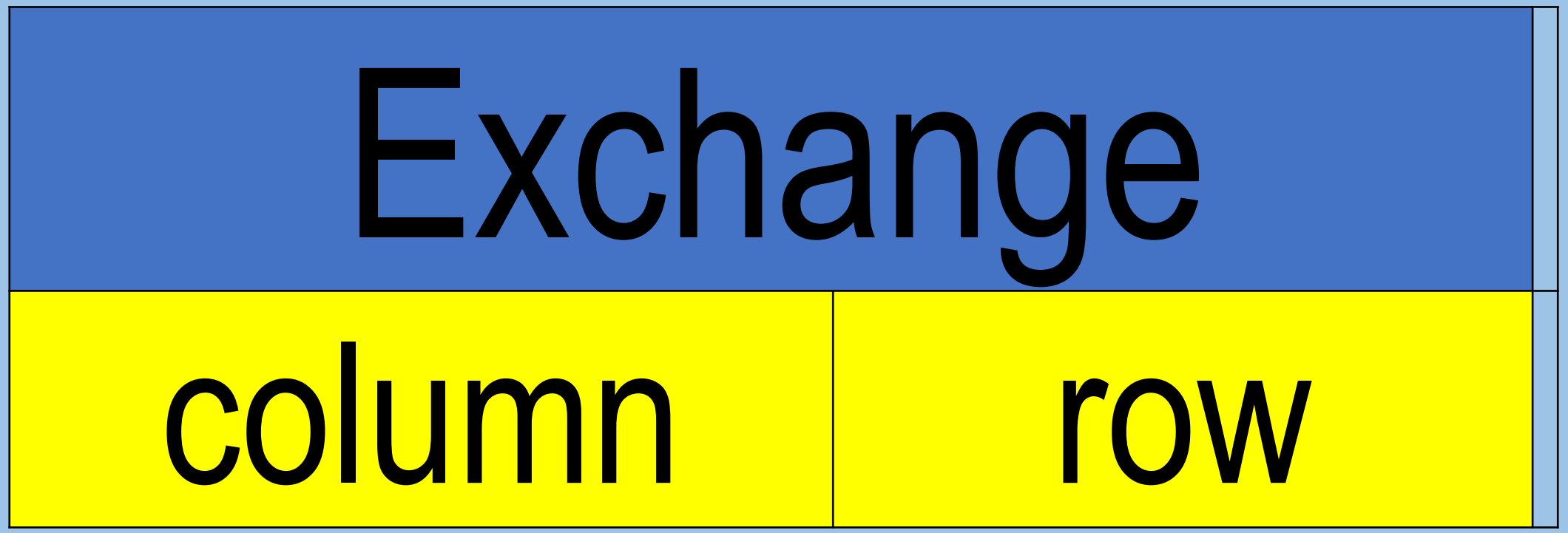
Read as: 6 times 3 equals 18

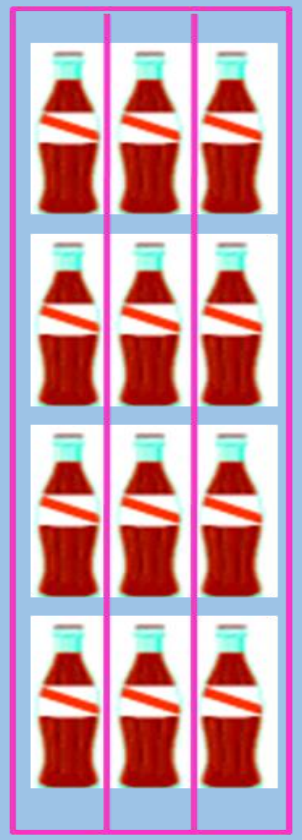
How many apples are there in the plates?

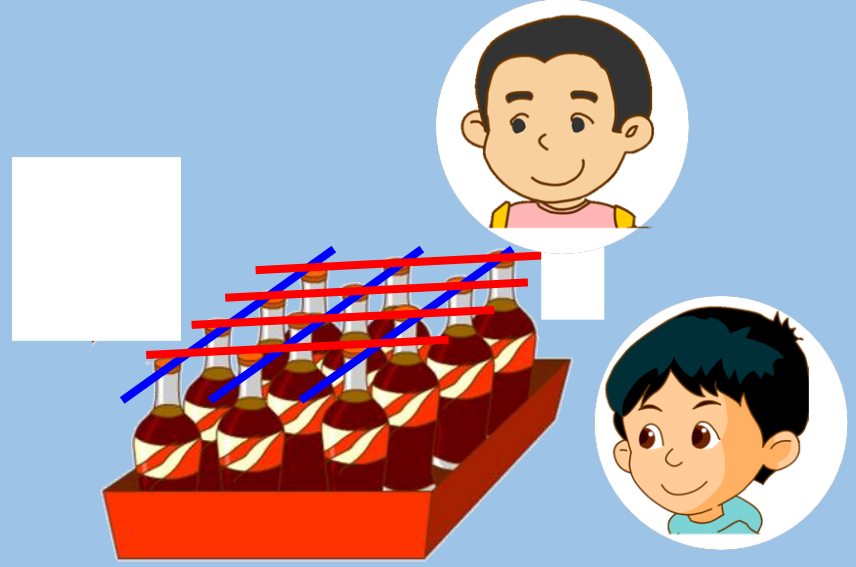
1+2+2+3=8

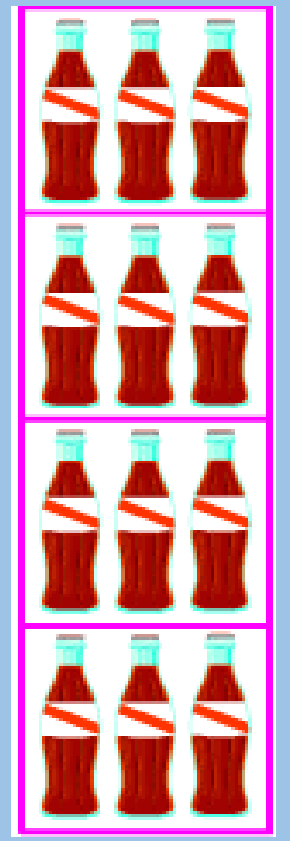
2+2+2+2=8

4 X 2 = 8


Exchange
column
row







$3 \times 4 = 4 \times 3$

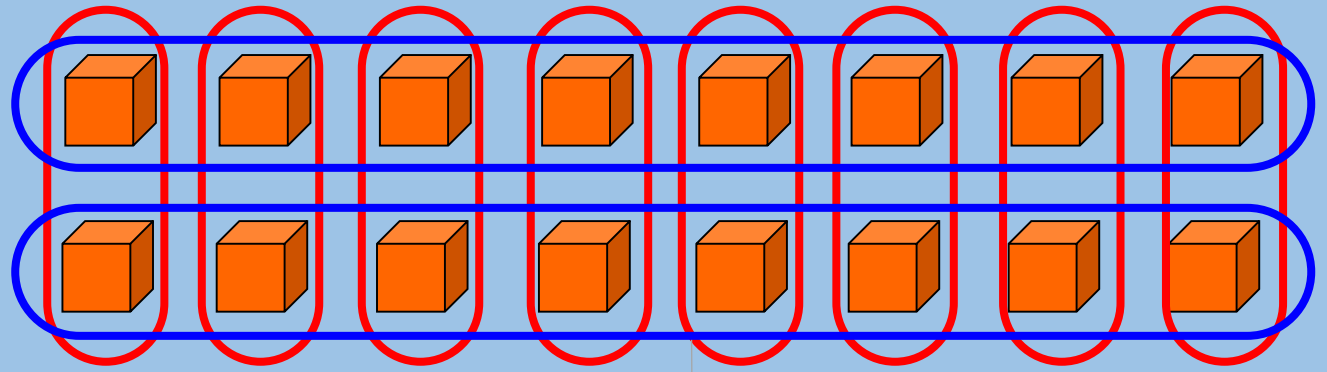
There are 3 columns,
There are 4 in each column.

There are 4 rows,
There are 3 in each row.

The product is the same if we exchange the positions of the factors.

The product is the same if we exchange the positions of two factors.

Look and Say.



Exchanging the positions of the factors makes the calculation simple.

Multiplication：

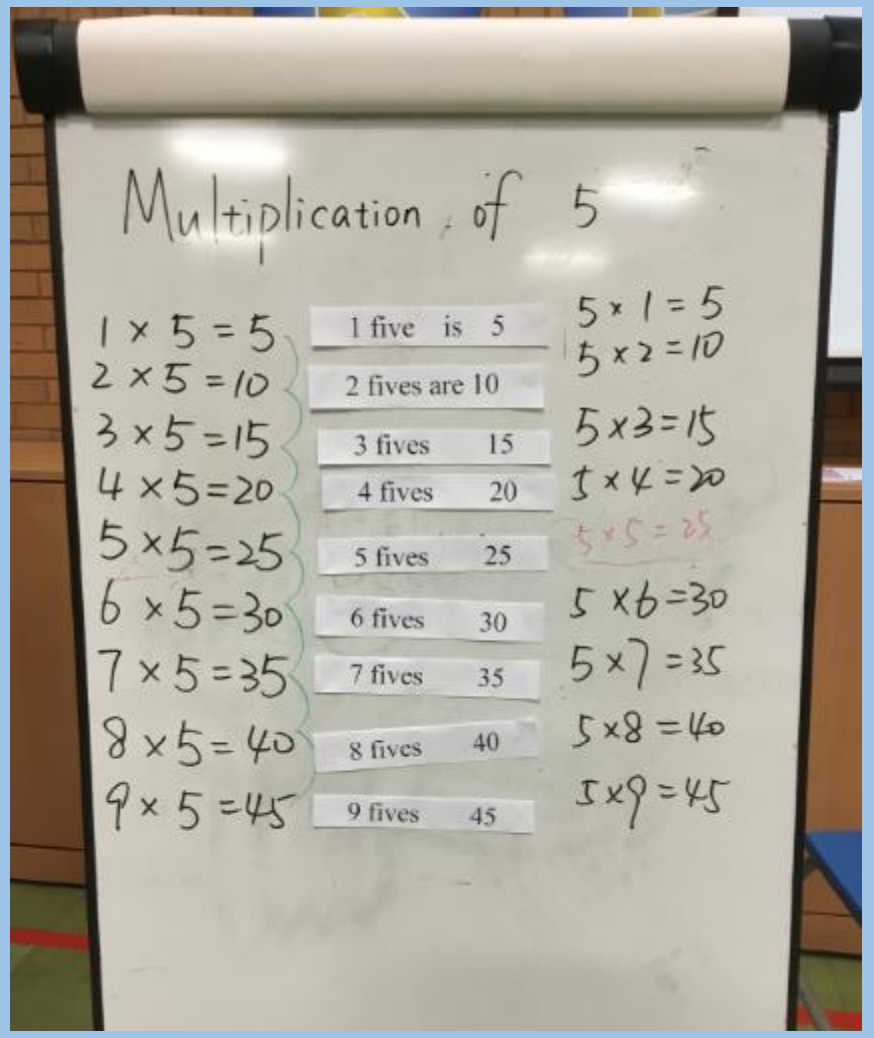
$8 \times 2 = 2+2+2+2+2+2+2+2 = 16$

add 7 times

Multiplication：

★$2 \times 8 = 8+8 = 16$

add only once


Multiplication of 5
1 × 5 = 5
2 × 5 = 10
3 × 5 = 15
4 × 5 = 20
5 × 5 = 25
6 × 5 = 30
7 × 5 = 35
8 × 5 = 40
9 × 5 = 45
1 five is 5
2 fives are 10
3 fives 15
4 fives 20
5 fives 25
6 fives 30
7 fives 35
8 fives 40
9 fives 45
5 × 1 = 5
5 × 2 = 10
5 × 3 = 15
5 × 4 = 20
5 × 5 = 25
5 × 6 = 30
5 × 7 = 35
5 × 8 = 40
5 × 9 = 45

Key Principles

Expectation for all children to use the language

Planning considerations – vocabulary, key stem sentences, chants and use of nouns

Emphasis on correct vocabulary when modelled by the teacher and practised by pupils