Lydgate Infant School
Parent Information Evening

Introduction to
Teaching Primary Mathematics for Mastery

Teaching Primary Mathematics for Mastery

At Lydgate Infants we have started to use a Teaching for Mastery approach to teaching maths.

But.....

What is Mastery?

First let's think about what it isn't!

Many people have seen the TV programmes about how maths is taught in China. This has led to some misconceptions about mastery.

Large Classes
Passive Learners
Rote Drilling

X

Large Classes
Active Learners
(mathematical thinkers)
Intelligent Practice
(leading to fluency)

✓

But what does it mean to master something?

- I know how to do it
- It becomes automatic and I don't need to think about it- for example driving a car
- I'm really good at doing it – painting a room, or a picture
- I can show someone else how to do it.

Maths mastery is.....

- Achievable for all
- **Deep** and sustainable learning
- The ability to build on something that has already been sufficiently mastered
- The ability to reason about a concept and make connections
- Conceptual and procedural fluency

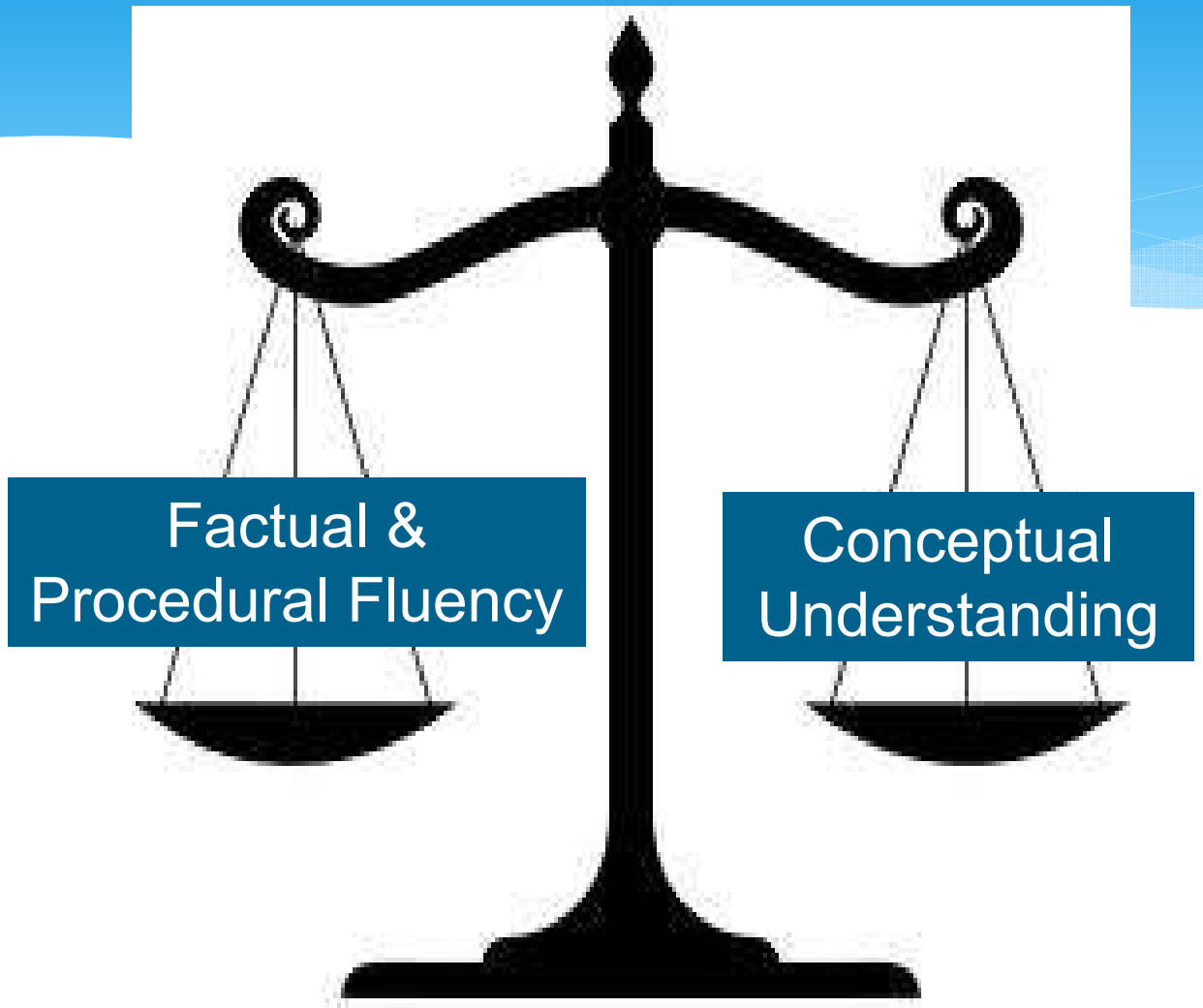
What are some of the defining characteristics of Mastery?

What does it look like?

* Keeping the class working together so that all can access and master mathematics.

* Longer time on key topics, providing time to go deeper and embed learning.

The Maths Curriculum



What is Depth?

Depth is….

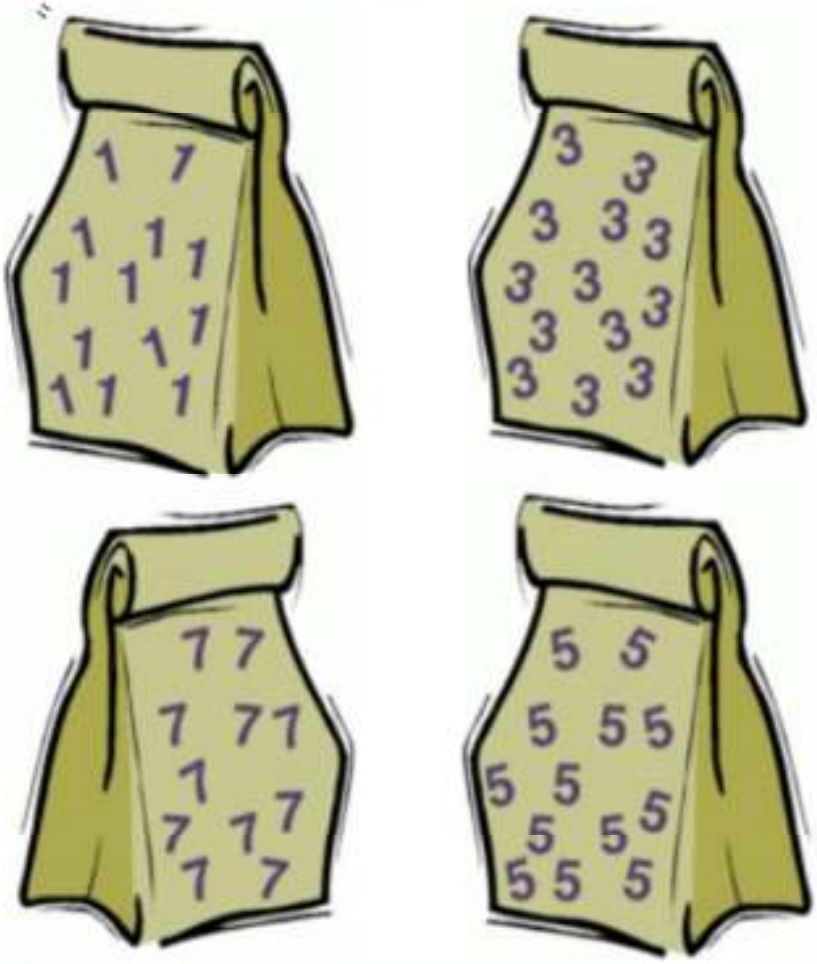
an understanding of concepts which enables connections to be made between mathematical ideas.

Without deep learning that progress cannot be sustained.

Make 37

Four bags contain a large number of 1s, 3s, 5s and 7s.

Pick any ten numbers from the bags so that their total is 37.



Did you manage to do it?

* Conceptual understanding would make us realise that in fact we cannot make a total of 37!
* This is because adding together an even number of odd numbers will never make another odd number.
* Two odds always make an even!

So how do we get there? Implementing the Mastery approach at Lydgate.

Mastery of Maths in EYFS

There are two Early Learning Goals for Maths. This is what most children in Reception are expected to be able to do by the end of their first year at school.

Number

* **Number:** 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. Using 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.

Shape, Space and Measure

* **Shape, Space and Measure:** Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.

What predicts success in Maths?

Research says:

In the Early Years:

Parents' engagement and home learning

A balance of child and adult-led activities

Early number sense

What do children say in response to the question, ‘Why do we count?’

Why do we count?

to learn…

to say 1, 2, 3, 4, 5…

to do numbers….

Why We Start Small.

Focusing on Counting

Though many of our children come in being able to count to 10 and beyond, counting is seen as a social activity done to please adults.

Children often have a knowledge of small quantities and an ability to say a series of counting words but this does not mean they have integrated the two skills.

Principles of Counting

* 1:1
* stable order
* cardinal
* abstraction
* order irrelevance

How do we count?

In Class

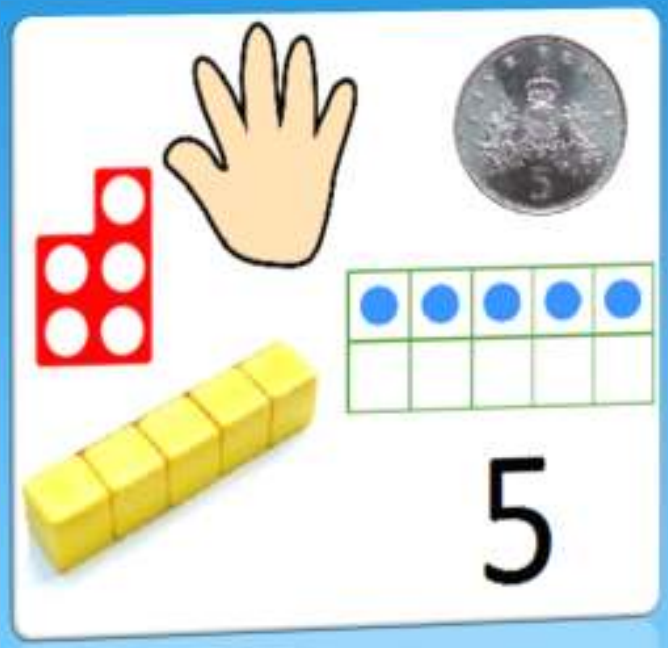
* That we need to say one number for each object counted (touch counting).
* The final number we say is how many altogether. Some children continue to count after they have reached the final object as they don't connect the numbers they are saying to the objects in front of them.
* That we can count objects in any order and the total stays the same.

For the Child

* Say 1 word for 1 thing
* Line things up to make counting easier
* Point as you count
* The last number you say is how many there are

Representing Numbers

We want to develop children's number sense so that they understand the number rather than just recognising the numeral. Children need to understand that numbers can be represented in many ways, not just as a written numeral. We use many different objects and pictures to show that numbers can be represented in lots of ways.

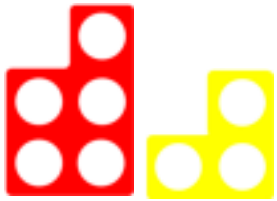


Using Mathematical Language in EYFS

Language and communication

Pupils deepen their understanding by explaining, creating problems, justifying and proving using mathematical language. This acts as a scaffold for their thinking and deepening their understanding further.

Number



Justifying — If we added a 2 piece to the 3 it would be the same and they would both make 5.

Re-telling — The 5 is 2 bigger than 3 .

Describing — 5 is bigger than 3 .

Naming — There are 5 and 3.

Shape

Justifying — I used a circle because it is curved. A wheel is curved like a cylinder so that it can roll.

Re-telling — I have used three circles for the wheels in the picture.

Describing — The circle has a curved side.

Naming — This is a circle.

Challenge/Independent Learning

Children are giving the opportunity to explore and extend their learning through targeted continuous provision.

They are also encouraged to explore challenges based on current learning, to allow children to explore concepts at their own level and foster curiosity and confidence in their mathematical thinking.

Ways to help at Home

Numberland

Numberblocks

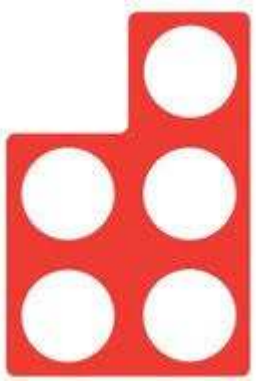
What is this?

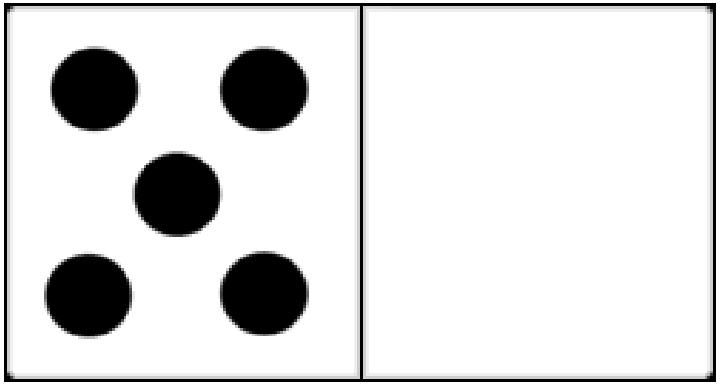
The numeral is a symbolic representation of five for some children that is a big jump.

What is five?

Five things – concrete.

The next step.



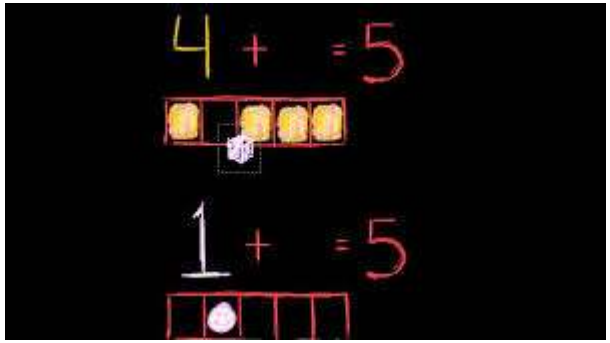


Pictorial representation of number

And then....

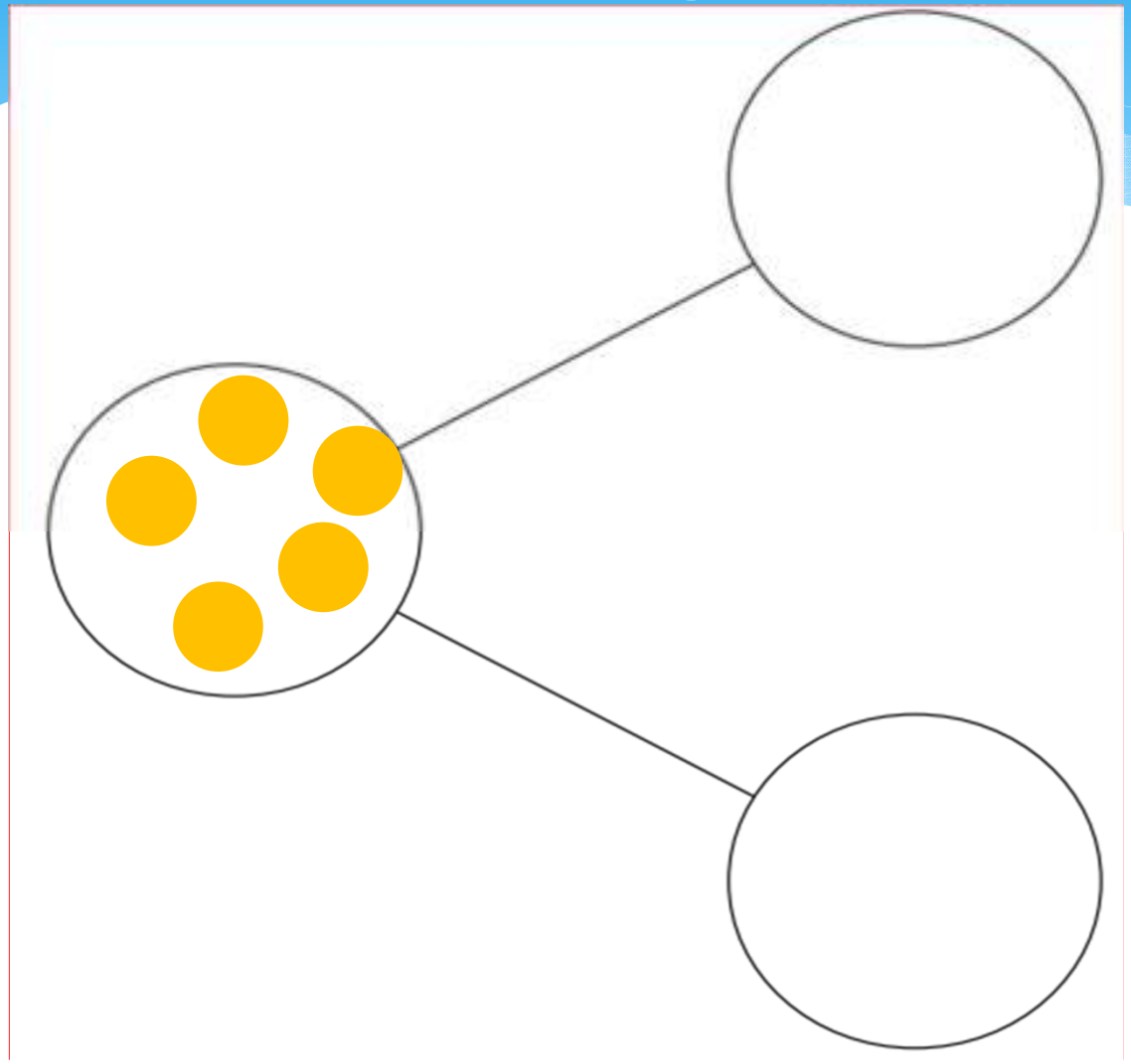
The symbol we use to represent 5

Mathematical development



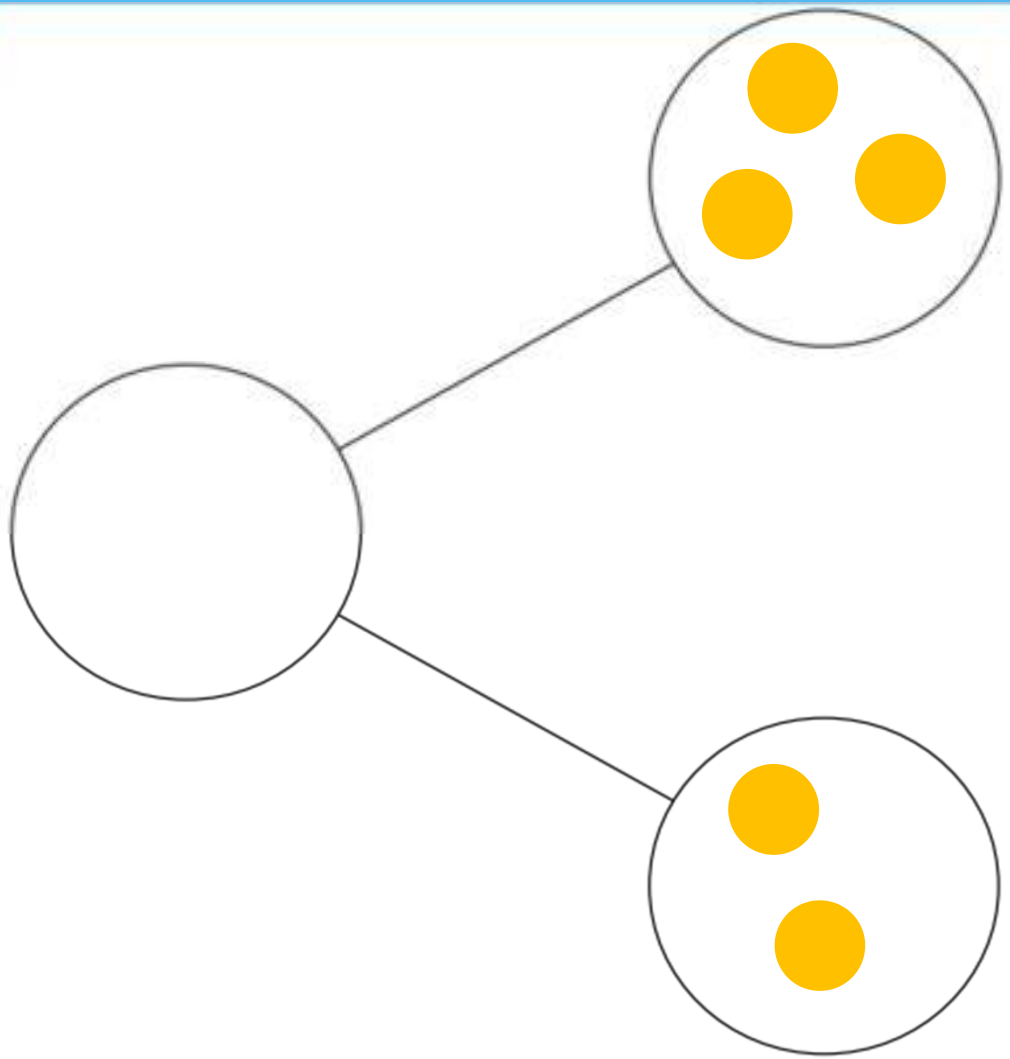
Continuing the Journey into Key Stage 1

Partitioning and Combining



Five is the whole

Partitioning and Combining



Five is the whole
three is a part and
two is part.

Part whole relationships

5 is the whole

3 is a part and 2 is a part

5 is the whole

The Bar model

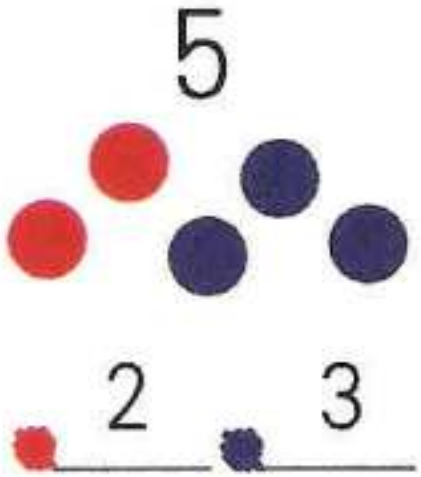
5

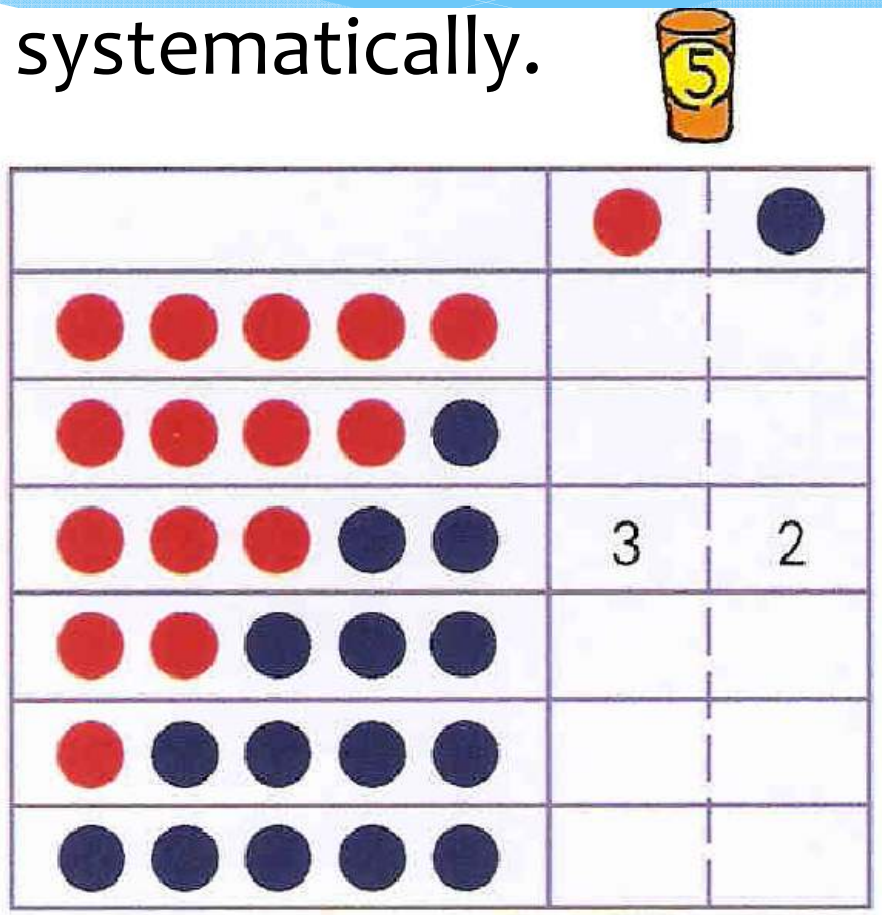
2

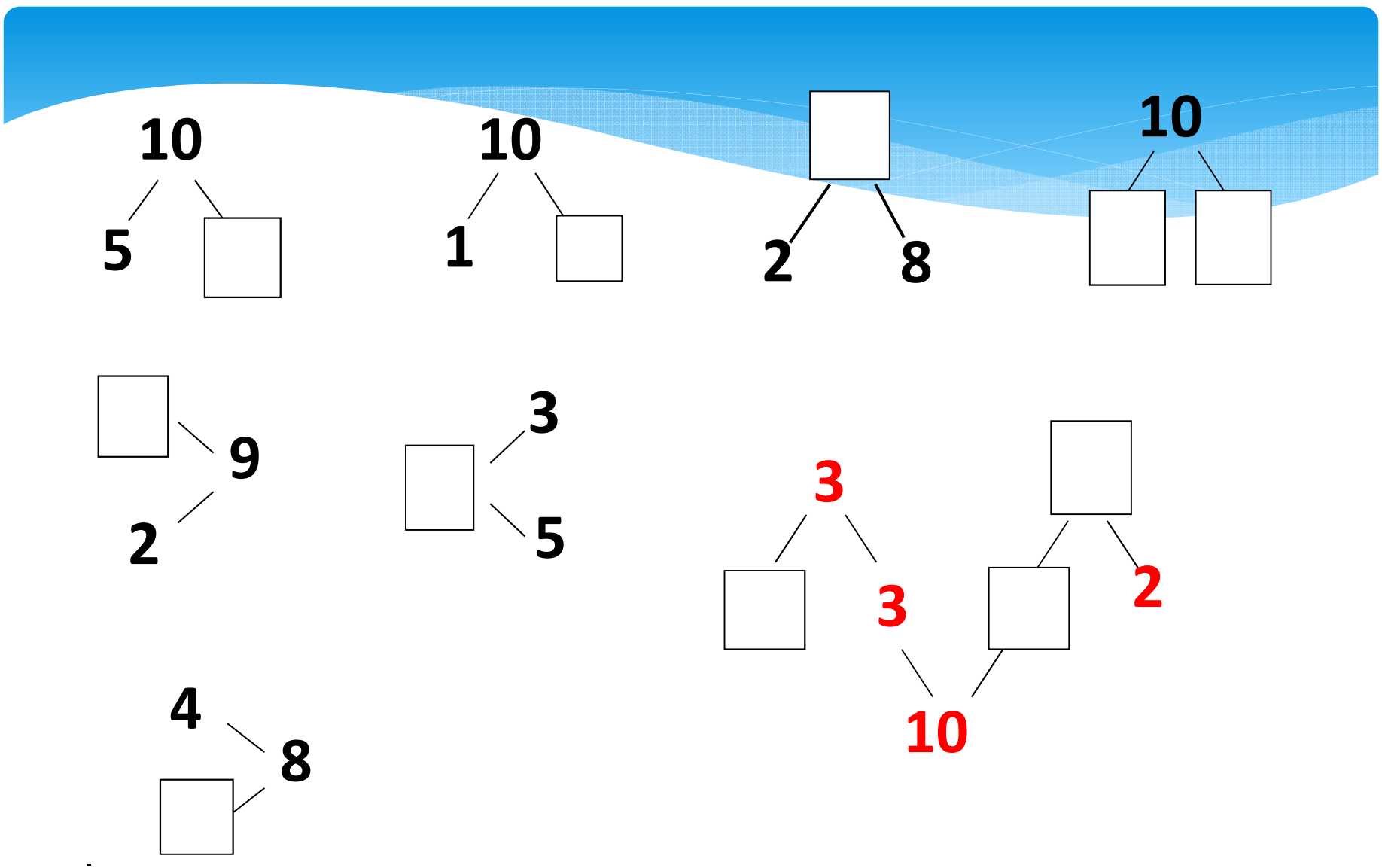
3

Representing the Part -Whole Model
Attention to Structure

Working systematically.






10
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9
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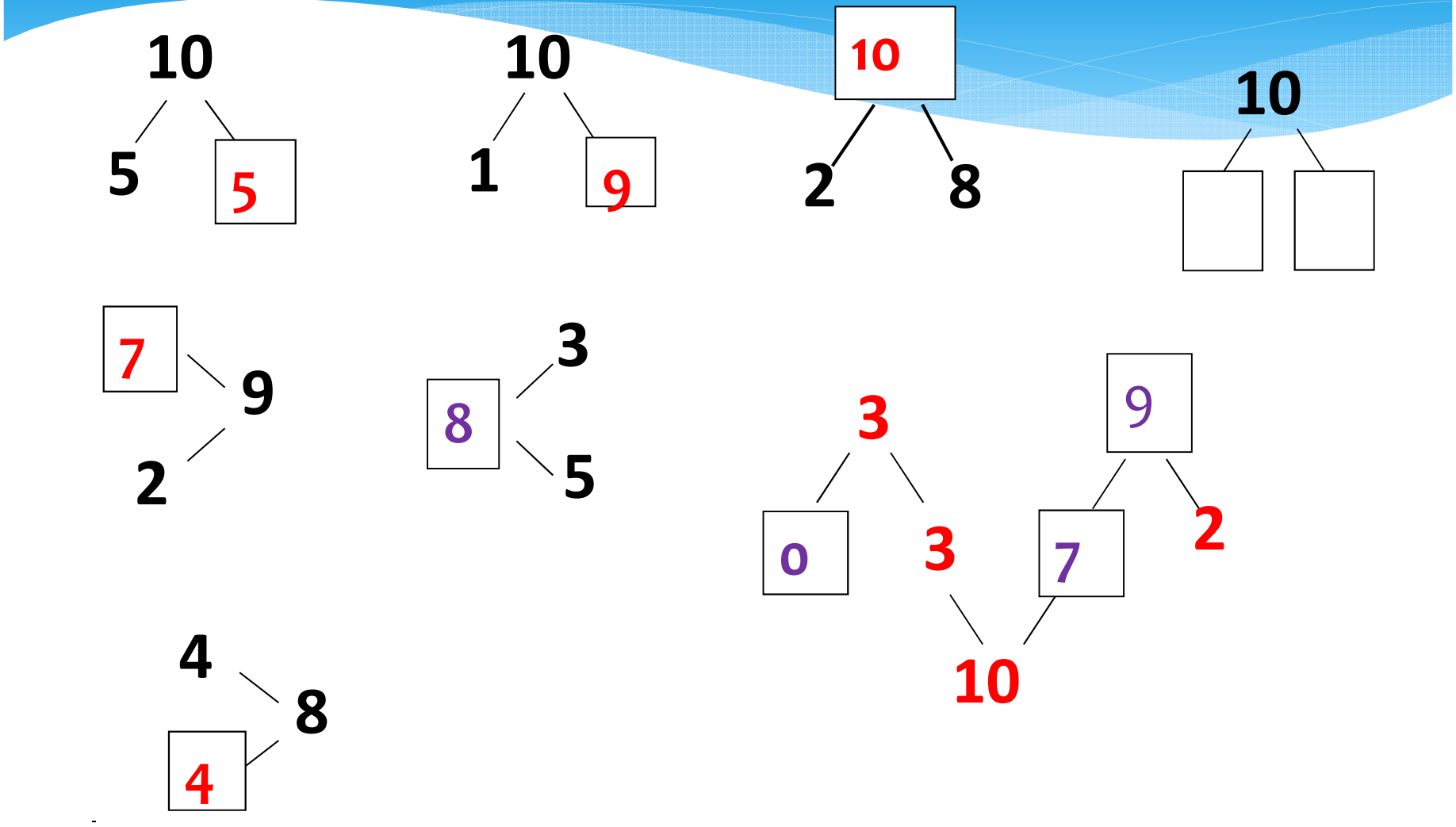
4
8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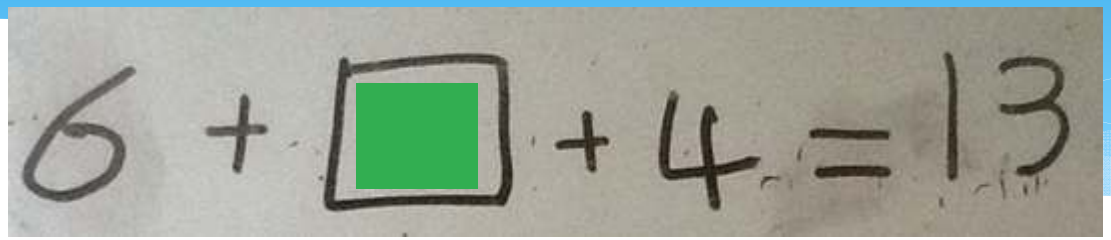
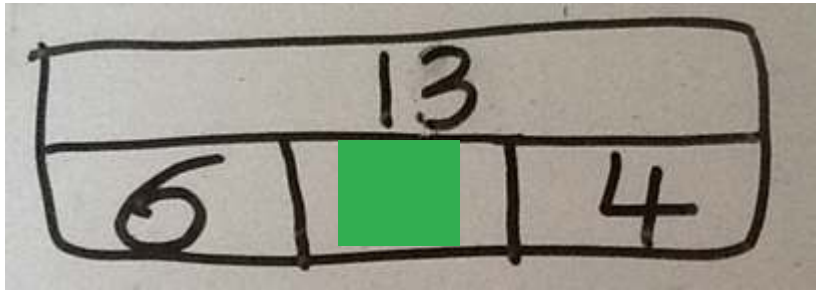
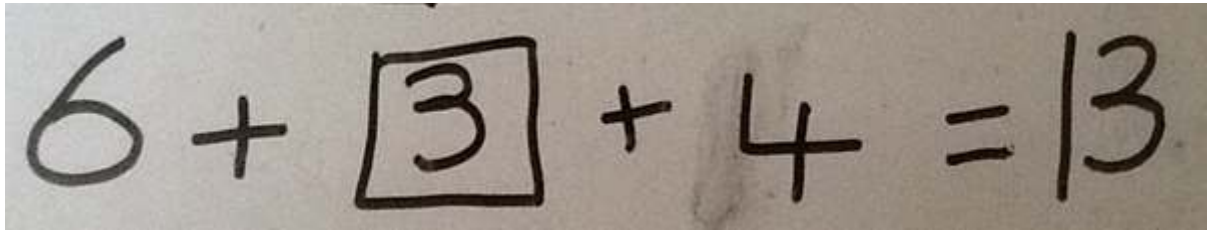
4

Empty box problems.







23.11.15

WALT add three 1-digit numbers

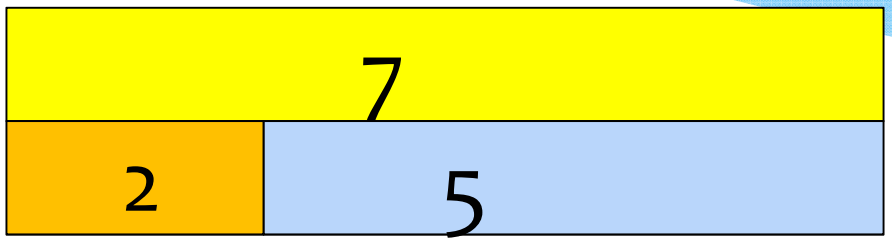
$5 + 4 + 9 =$ 18

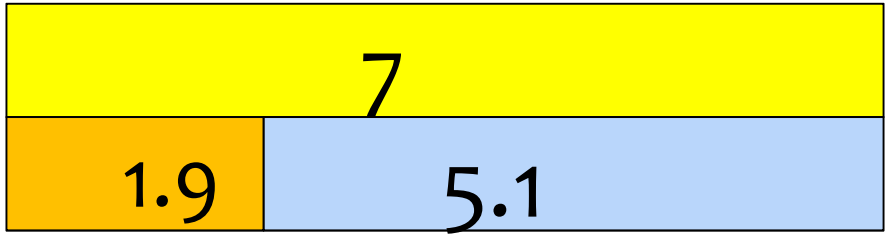
$6 +$ 2 $+ 4 = 12$

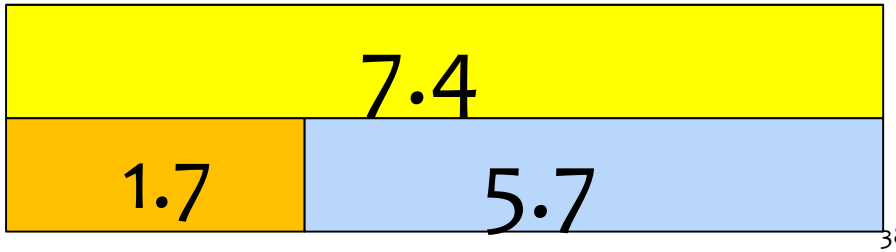
6 $+ 3 + 2 = 11$

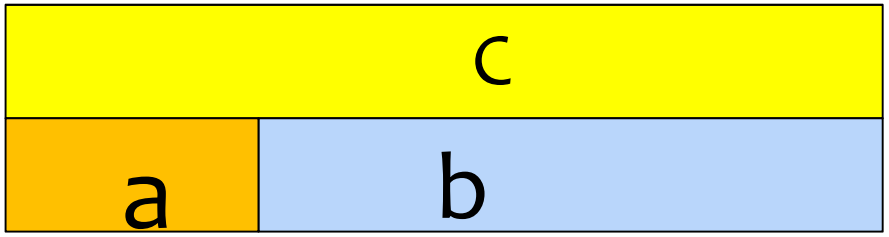
3 $+$ 2 $+$ 5 $= 10$

Developing Depth/Simplicity/Clarity









Ralph posts 40 letters, some of which are first class, and some are second.

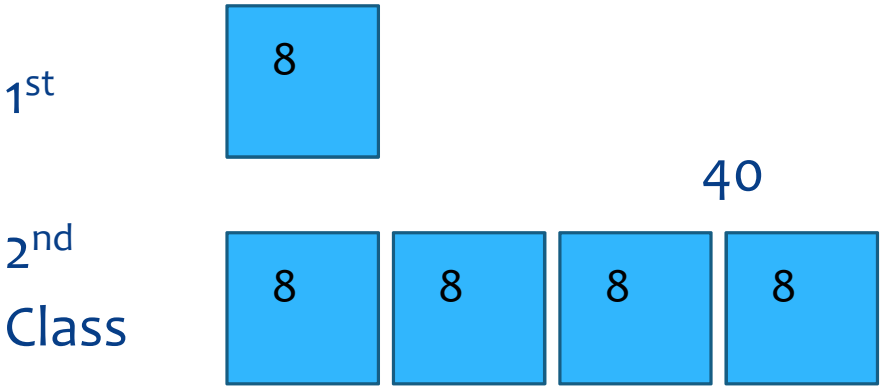
He posts four times as many second class letters as first.

How many of each class of letter does he post?

*40 letters

*He posts four times as many second class letters as first.

*How many of each class of letter does he post?

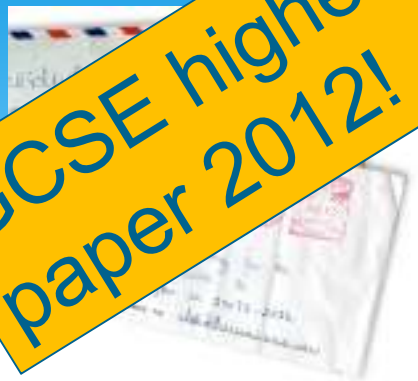


40 ÷ 5 = 8

8 x 4 = 32

1st Class 8 letters

2nd Class 32 letters



GCSE higher paper 2012!

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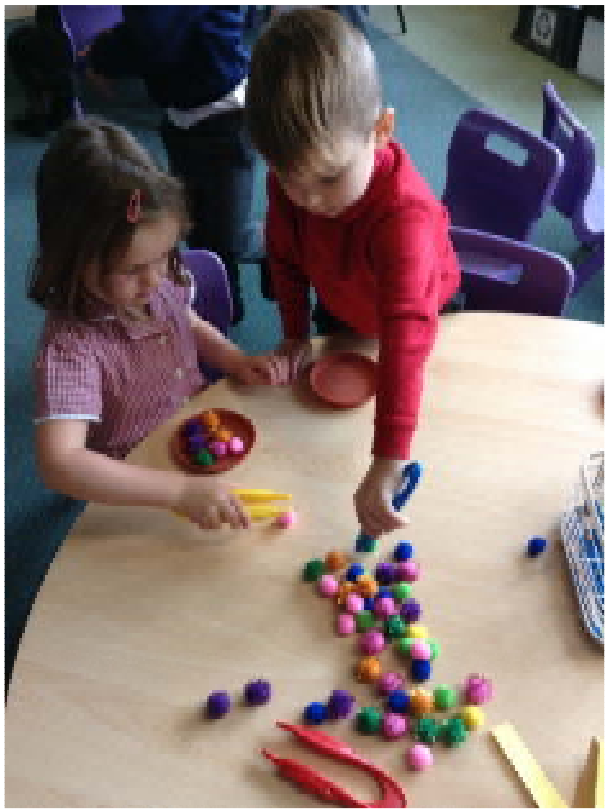


* We believe that everyone can do maths and there's no such thing as a maths person. Maths is a subject that everyone can and should be able to perform confidently and competently.

We teach maths by breaking the objectives down into the small steps, so that every pupil is secure in every new concept before moving on. We focus upon teaching for fluency, reasoning and problem solving.

A typical maths lesson

Key instant recall facts.

Whole class introduction

Guided Practise

Skill

Master

Prove it (Reasoning)

Deepen (Problem Solving)

Teaching and modelling the use of mathematical vocabulary.

* Key vocabulary is shared at the start of the session
* Sentence starters scaffold the children's use of full sentences
* Children are encouraged to use full sentences to respond to questions, with adults modelling structures
* Opportunity for purposeful talk tasks throughout the session at skill, master and deepen levels
* Opportunities for children to reason and explain what they are learning about

Deepening the Learning

Reasoning and Problem solving.

Talking about the maths you are doing and using your knowledge to solve
Mathematical problems.

Maths at Home

Ten Dos and One Don't

A lot of maths at home is invisible to children

A lot of maths at home is invisible to children

Tesco British Whole Milk
2.272L, 4 Pints

Write a review >

£ 1.09 £0.48/litre

1 Add

Tesco British Whole Milk
3.408L, 6 Pints

Write a review >

£ 1.50 £0.44/litre

1 Add

Making maths more visible at home

The best spaghetti Bolognese recipe

★★★★★(268 ratings) By Andrew Balmer Magazine subscription – 5 issues for £5

PREP: 25 MINS
COOK: 1 HR, 50 MINS

EASY

SERVES 6

Our best ever spaghetti Bolognese is super easy and a true Italian classic with a meaty, chilli sauce. This recipe comes courtesy of BBC Good Food user Andrew Balmer.

sauce only

Nutrition: per serving

kcal	fat	saturates	carbs	sugars	fibre	protein	salt
624	25g	10g	58g	12g	6g	35g	1.6g

Save to My Good Food

Print

Maths = Talking

Build connections between home and school

What is it with teachers and pizzas?

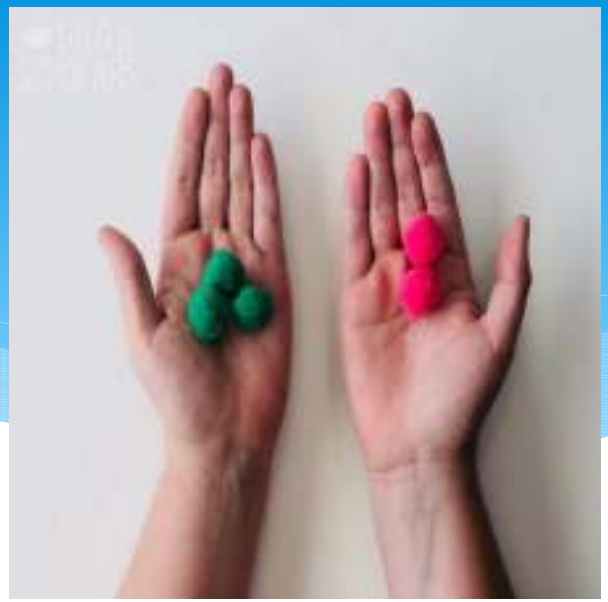

Duet II
npower
11:28
So Far Today
£ 1.81
more


Freezer
Mode
-18°C
4°C
Fridge
Lock
3 SEC.

Really Important Knowledge: Reception

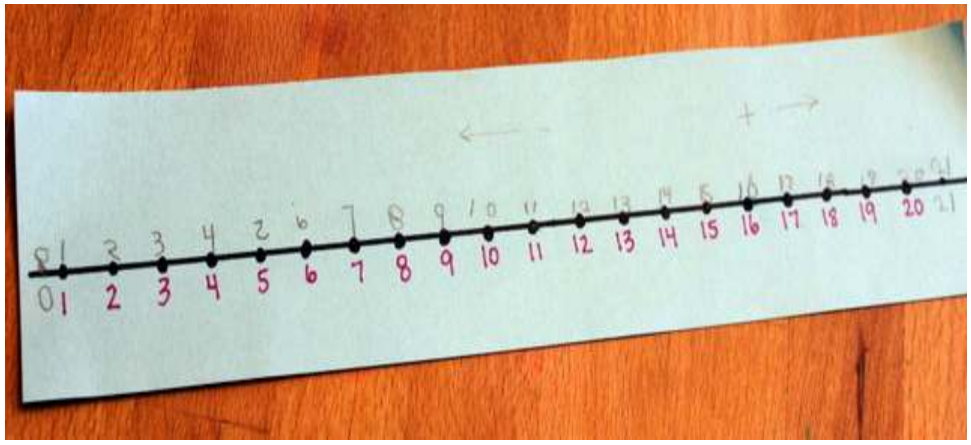
* Counting up to 10, then 20, AND COUNTING BACK
* 'Story of 3, 4, 5, 6'
  * 1+ 4 = 5, 2 + 3 = 5, 3 + 2 = 5, 4 + 1 = 5
  * 5 = 4 + 1, 5 = 3 + 2 etc
  * 'There are 5 grapes on a plate. Jack ate 2. How many are left?'
* One more, one less up to ten
* Subitising (seeing amounts up to 6 and just recognising them)
* Shape names and properties

F2 Maths Models



Different ways to represent 5

1 – 20 number line



Really Important Knowledge: Year One

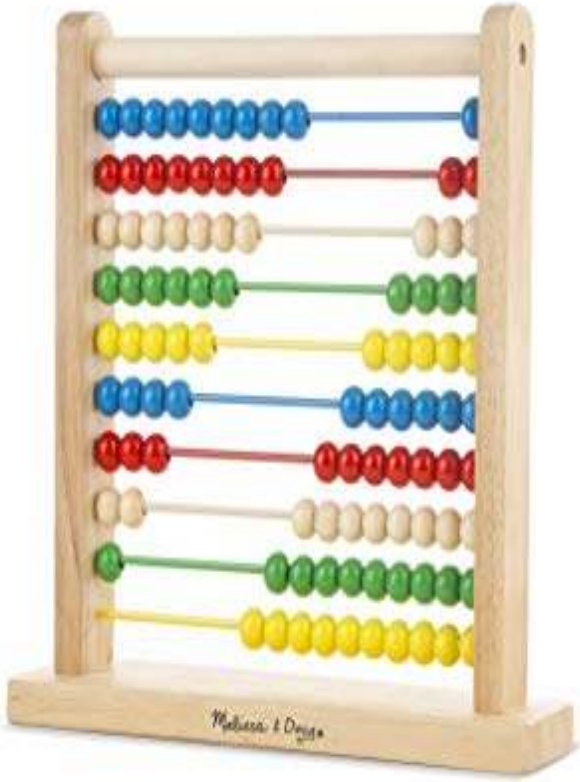
* Counting up to 100 AND BACK from differnt starting points.
* Knowing one more and one less than all numbers to 100 (especially 19, 29, 39 etc)
* Bonds to ten by heart
  * 9+1, 8+2, 7+3, 6+4, 5+5, 4+6, 3+7, 2+8, 1+9
* Understanding what a half and a quarter mean in everyday contexts 'There are four of us eating. Shall I cut the pizza into halves or quarters?'
* Recognise all coins up to £1. Understand the concept of 'change'.

Year One Maths Models at Home

1- 100 number line

Abacus

Coins to use



Really Important knowledge: Year Two

* Bonds to 20
  * 11 + 9, 12 + 8, 13 + 7, 14 +6, 15 + 5, 16 + 4, 17 + 3, 18 + 2, 19 + 1
  * 20 – 1, 20 – 2, 20 – 3, 20 – 4, 20 – 5 etc
* Bonds to all numbers up to 20
  * All the different ways to make 11, 12, 13, 14, 15, 16, 17, 18, 19 etc
* Knowing 2s, 5s, 10s timetables by heart
* Understanding the concept of ¼, 1/3, ½, ¾
* Using money in everyday contexts (coins and notes). Understanding the concept of change.
* Telling the time

Year 2 Maths Models at home

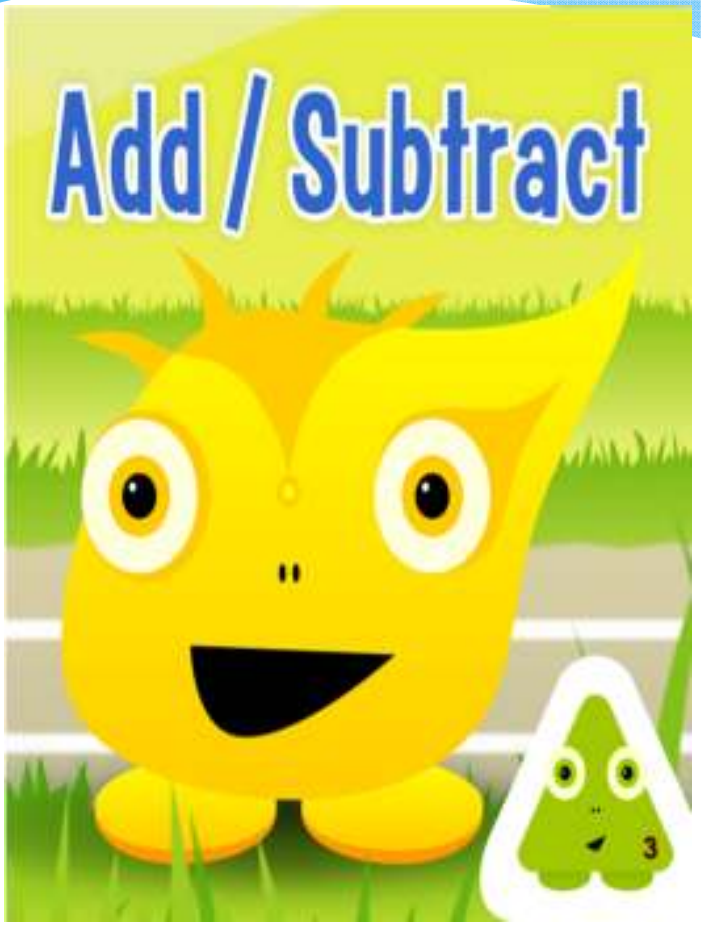
1 – 100 numberline (only 10s marked)

Abacus

Coins to use

Analogue clock

7th Birthday



EducationCity.com

What not to do

“Don’t worry. I was terrible at maths too.”