Maths Mastery in Year 1

parents Workshop

January 2020

AVANTI HOUSE

EXCELLENCE · VIRTUE · DEVOTION

Aims

The national curriculum for mathematics aims to ensure that all pupils:

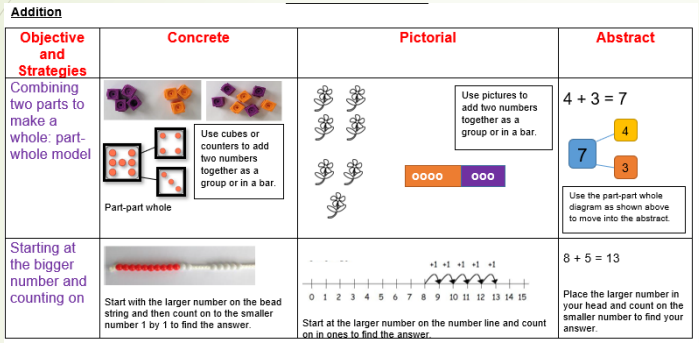
- Become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- **Reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- Can **solve problems** by applying their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas.

KS 1 statutory curriculum

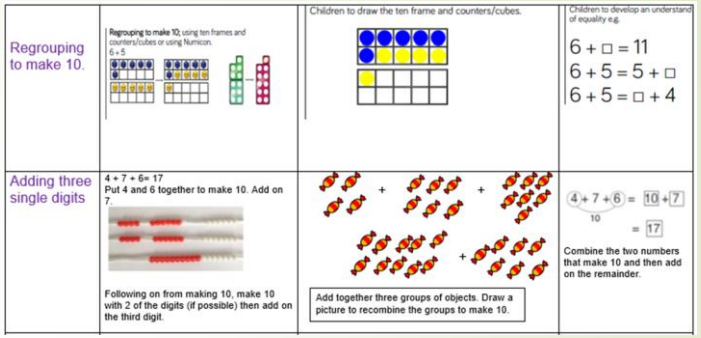
The curriculum is designed so that pupils explore mathematical ideas **in depth**.

- Number – number and place value
- Number – addition and subtraction
- Number – Multiplication and division
- Number – fractions
- Measurement
- Geometry: properties of shape
- Geometry – position and direction
- Mastery curriculum
- Reading and spelling of mathematical vocabulary



Addition

Objective and Strategies	Concrete	Pictorial	Abstract
Combining two parts to make a whole: part-whole model	Use cubes or counters to add two numbers together as a group or in a bar. Part-part whole	Use pictures to add two numbers together as a group or in a bar.	4 + 3 = 7 Use the part-part whole diagram as shown above to move into the abstract.
Starting at the bigger number and counting on	Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.	Start at the larger number on the number line and count on in ones to find the answer.	8 + 5 = 13 Place the larger number in your head and count on the smaller number to find your answer.



Regrouping to make 10.	Regrouping to make 10, using ten frames and counters/cubes or using Numicon. 6 + 5	Children to draw the ten frame and counters/cubes.	Children to develop an understand of equality e.g. 6 + □ = 11; 6 + 5 = 5 + □; 6 + 5 = □ + 4
Adding three single digits	4 + 7 + 6= 17 Put 4 and 6 together to make 10. Add on 7. Following on from making 10, make 10 with 2 of the digits (if possible) then add on the third digit.	Add together three groups of objects. Draw a picture to recombine the groups to make 10.	4 + 7 + 6 = 10 + 7 = 17 Combine the two numbers that make 10 and then add on the remainder.

Calculation Policy

Mathematics Mastery

Using spoken and written language with confidence and clarity to explain and justify mathematical reasoning.

- Having a deep conceptual understanding of mathematical concepts and skills.

- Developing mathematical thinking, including generalising, classifying and comparing, and modifying.

MASTERY APPROACH:

Fluency: the ability to recall and apply knowledge rapidly and accurately.

Reasoning: explain their mathematical thinking

Problem solving: apply their knowledge to solve problems in varied contexts.

Encourages depth before new content

Speaking and Listening

- Vocabulary
- Questioning
- Full sentences with sentence scaffolds
- Reasoning and explanation
- Problem solving

What does it mean to master something?

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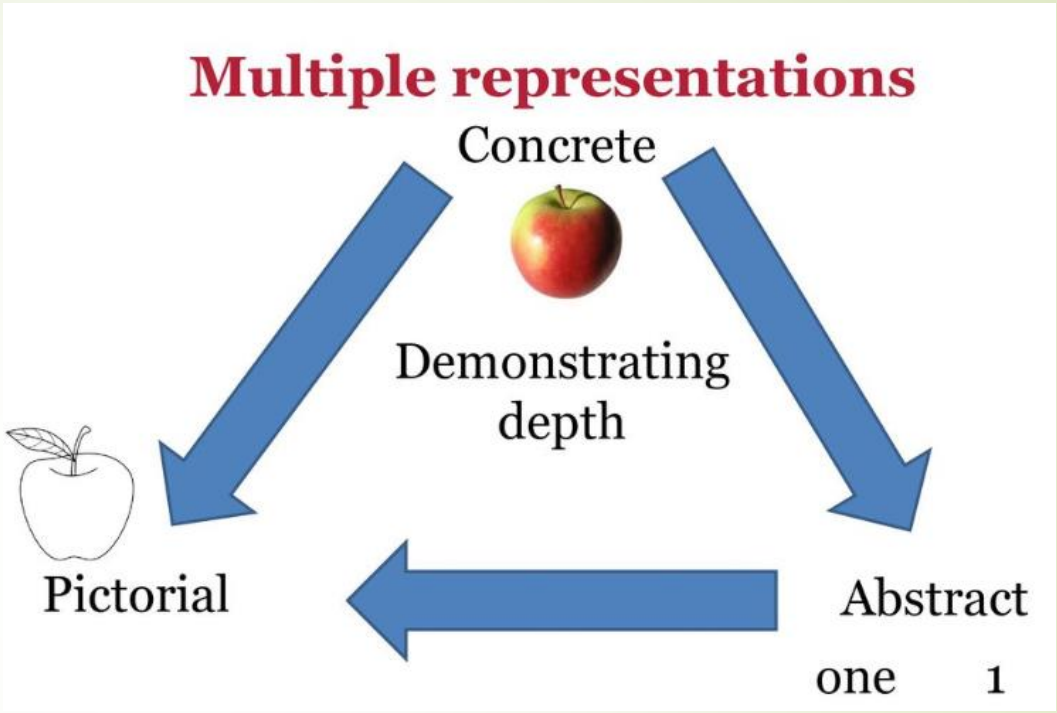
- I know how to do it
- It becomes automatic and I don't need to think about it- for example driving a car
- I'm really good at doing it – painting a room, or a picture
- I can show someone else how to do it.

"In mathematics, you know you've mastered something when you can apply it to a totally new problem in an unfamiliar situation."

Dr. Helen Drury, Director of Mathematics Mastery

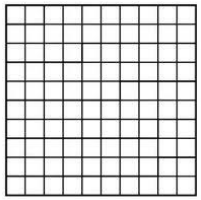
CPA Approach



What are concrete resources?

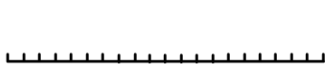
Bead strings

Numicon

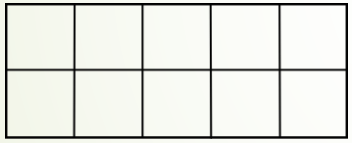


100 grids

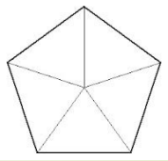
Number lines



Tens frames

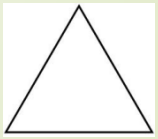


Shapes

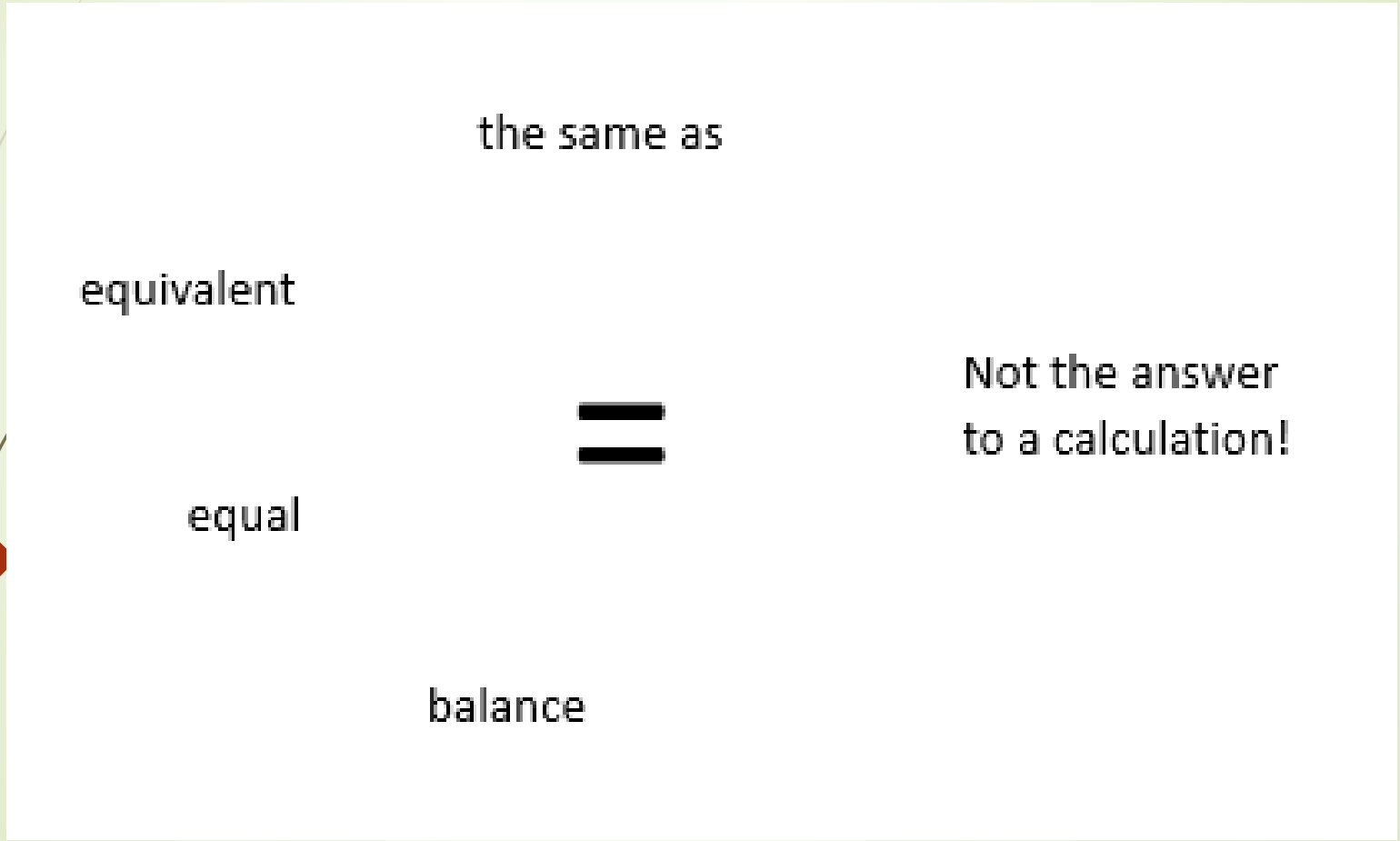


Dienes blocks

Multilink cubes



Understanding Equivalence



Maths Mastery in Year 1

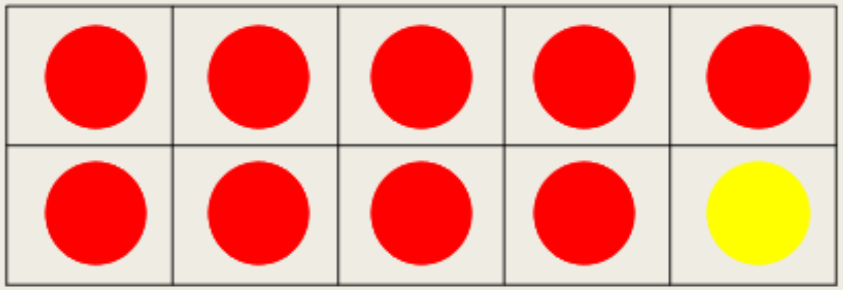
Then they can do missing number problems.

3 + __ = 10 10 = 3 + __

4 + __ = 10 - __ 15 = __ - 5

Importance of a Ten Frame

What do you notice?



What number statements can we make?

9 + 1 = 10
1 + 9 = 10

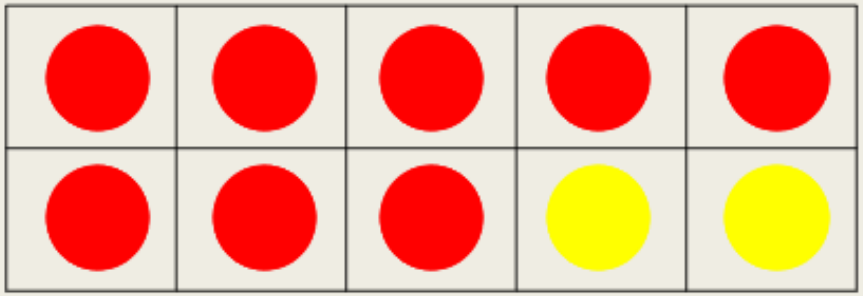
commutative

10 - 1 = 9
10 - 9 = 1

inverse

Importance of a Ten Frame

What do you notice?



What number statements can we make?

8 + 2 = 10
2 + 8 = 10 commutative

10 - 2 = 8
10 - 8 = 2 inverse

Your turn!

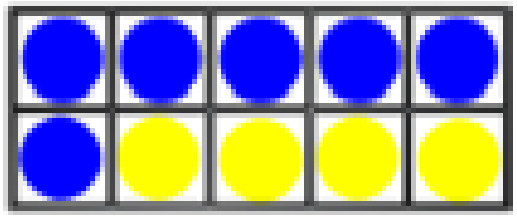
- We ask the children to know all the different ways that numbers can be represented and that they have a real understanding of the numbers.

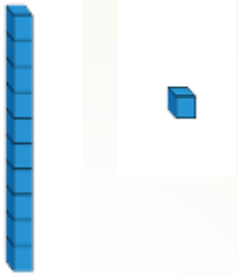
Using the resources available, can you show the number 6?

Make 6

These are some the resources we use in our lessons to represent numbers.

Ten frame

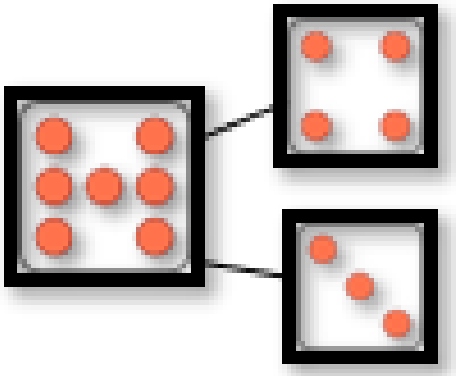




Base Ten

Beads string

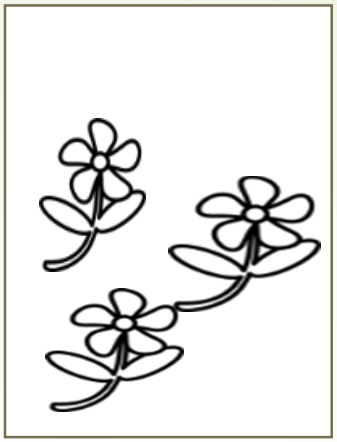
Part –whole model

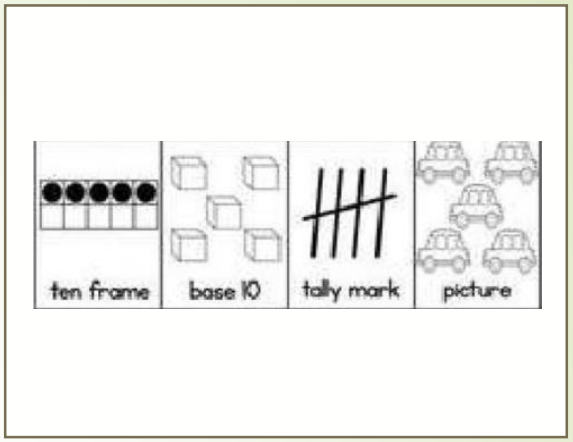


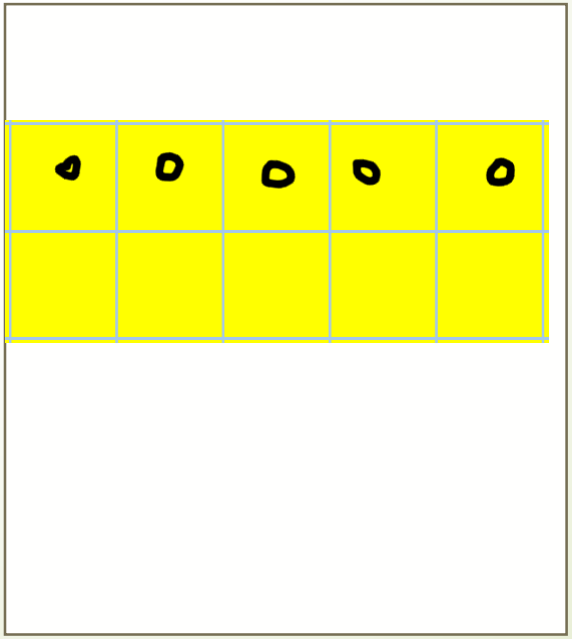
Coins

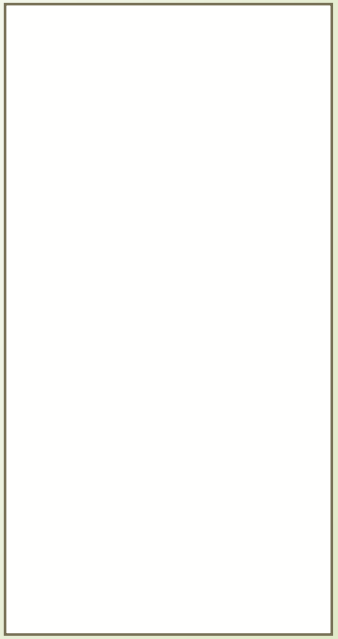
Cubes

How would you record 0-10 pictorially?









Mathematical Language

- Sharing essential vocabulary at the beginning of every lesson
- Modelling clear sentence structures using mathematical language

What do these words and phrases mean?

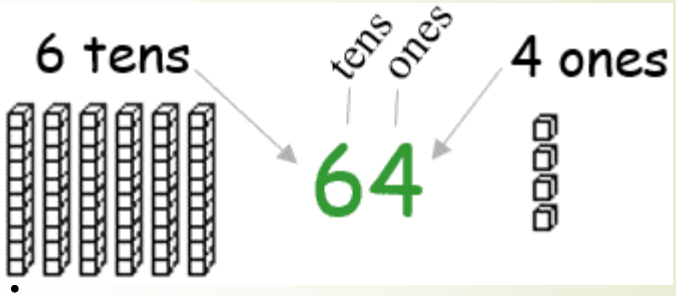
- Vertex/vertices
- Is equal to
- Tens and ones
- Fewer/less

I have **fewer**/less apples than Harry.

I have **fewer**/less money than Amit.

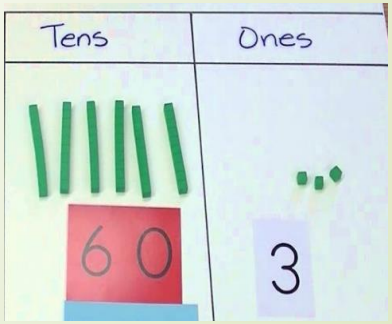
Number

- Order numbers – know how many tens and ones in a number – partition using tens and ones.
- Use a place value chart.
- Compare on a number line.



How do you know that 17 is more than 12?

How do you know that 9 is fewer than 14?

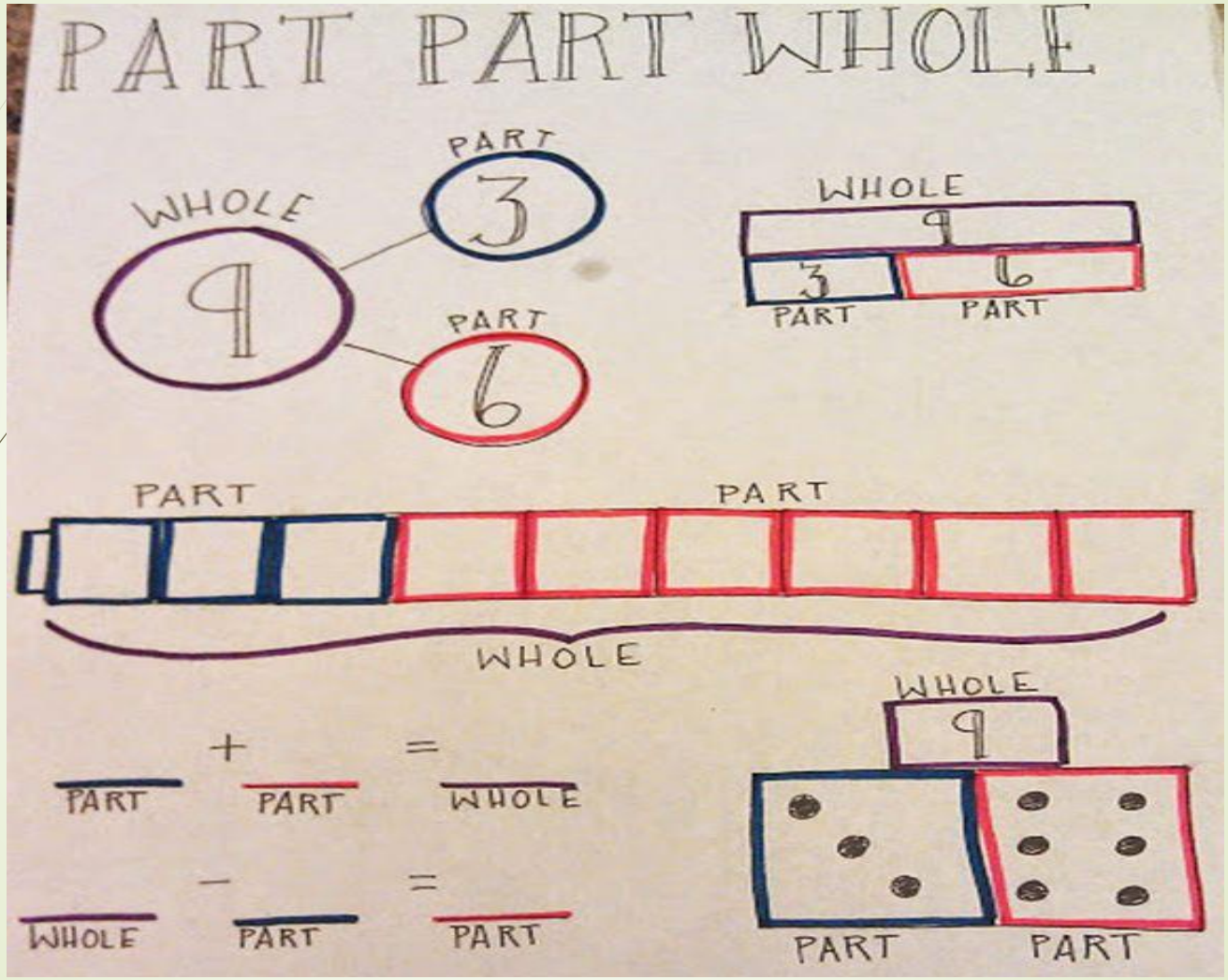


Add: Part-Whole Model

- Try these using the resources

???

- 5 + 4 =
- 12 + 8 =
- We also encourage counting on and using a number line.
- Doubles and number bonds


PART PART WHOLE
WHOLE
9
PART
3
PART
6
WHOLE
9
3
6
PART
PART
PART
PART
WHOLE
+
=
PART
PART
WHOLE
−
=
WHOLE
PART
PART
WHOLE
9
PART
PART

Subtract – part, part whole

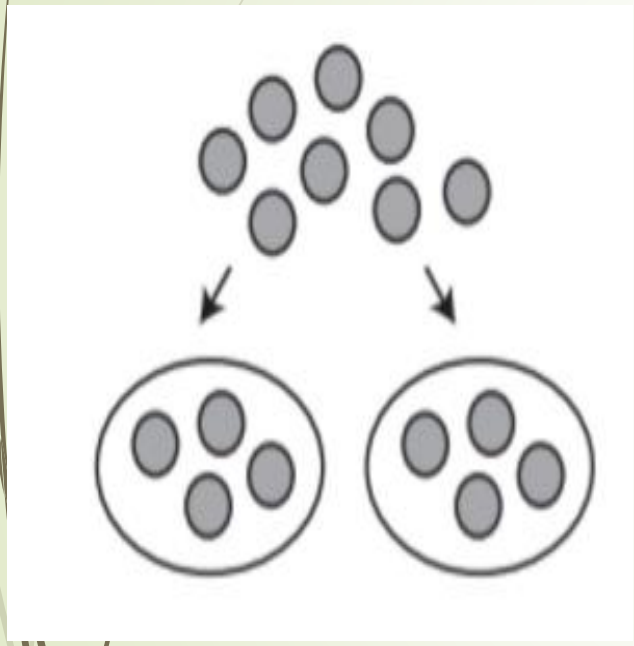
Try these using the resources

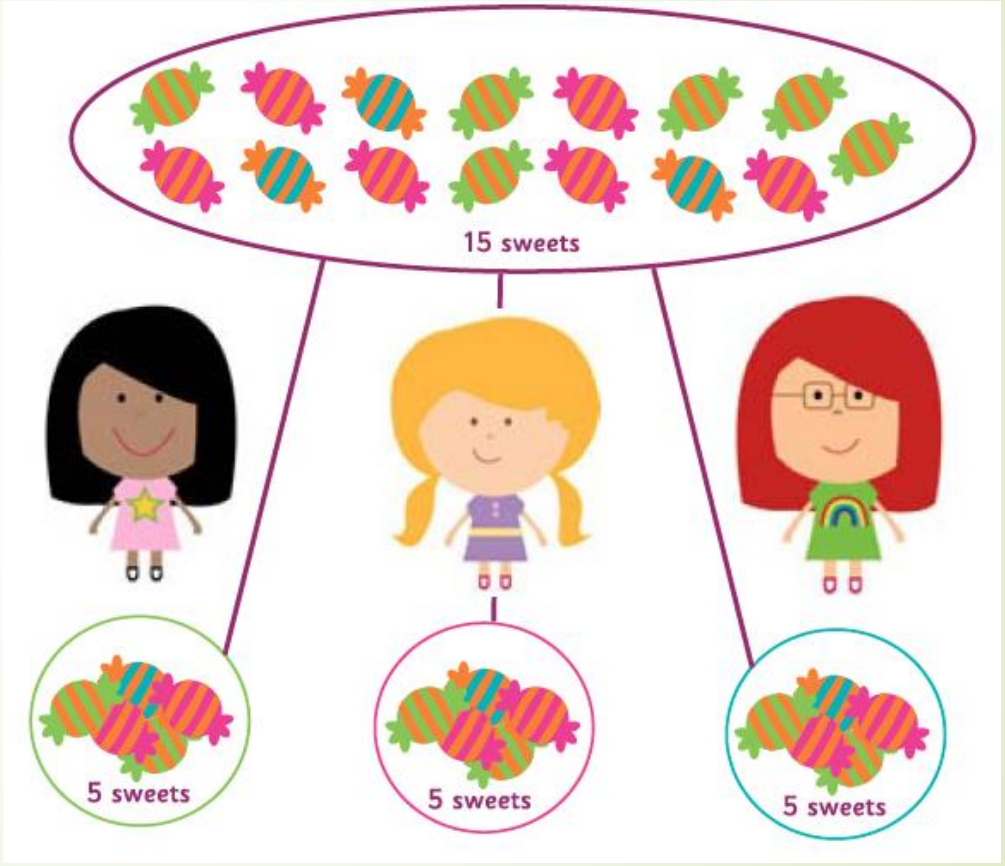
10 – 4 =

18 – 8 =

Again we also encourage the use of number lines to count back.

Half/share and dividing





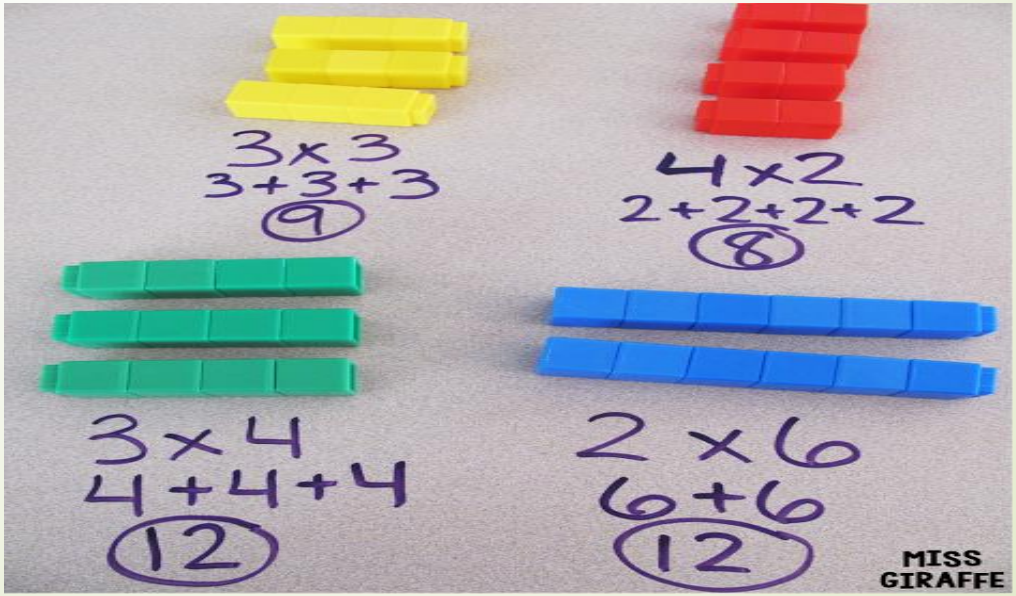
Multiplication

- In Year 1 children are expected to skip count in 2's, 5's and 10's from
- In Year 2 they need to be able to skip count in 2's, 3's, 4's, 5's and 10

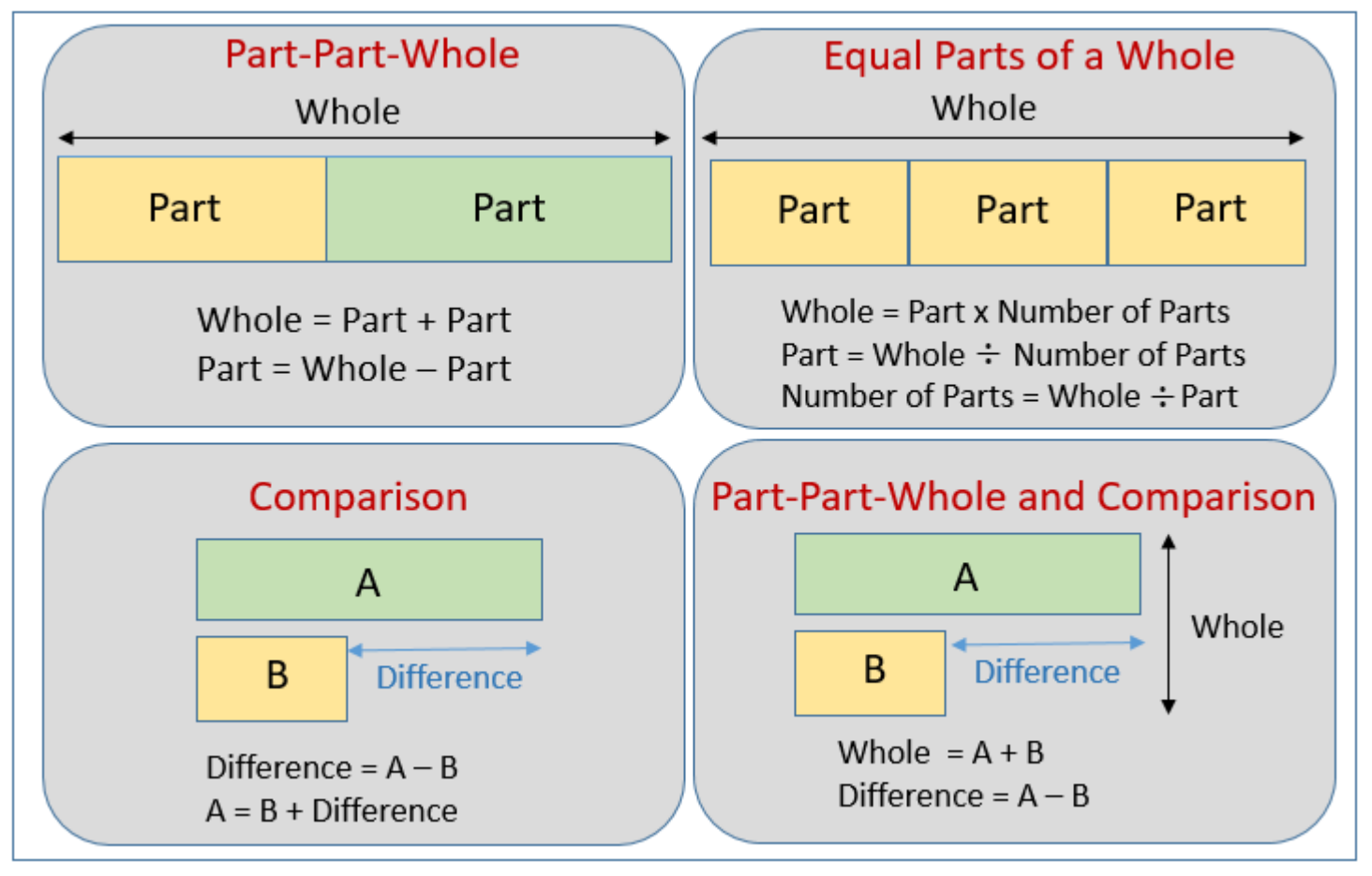
- Year 2 – repeated addition

5 x 2 = 2 + 2 + 2 + 2 + 2 = 5 + 5 =

- Arrays



Bar models


Part-Part-Whole
Whole
Part
Part
Whole = Part + Part
Part = Whole – Part
Equal Parts of a Whole
Whole
Part
Part
Part
Whole = Part x Number of Parts
Part = Whole ÷ Number of Parts
Number of Parts = Whole ÷ Part
Comparison
A
B
Difference
Difference = A – B
A = B + Difference
Part-Part-Whole and Comparison
A
B
Difference
Whole
Whole = A + B
Difference = A – B

What can I do at home?

- Website – questions
- Homework – amend numbers to check understanding as well for consolidation
- Mathletics is very good for mental maths. Look at class pages for websites.
- Encourage your child to talk in full sentences.
- Take every opportunity to look at maths that happens around you everyday

Questions

- Feedback sheet