



Grange Park
Primary School

Maths: practical strategies for home learning

PARENT WORKSHOP: Tuesday 9 July 2019



A decorative vertical banner on the left side of the slide. It features a blue background with various mathematical symbols and numbers in different shades of blue and white. Visible numbers include 1, 5, 6, 7, 8, 9, 0, 3, and 4. Symbols include a plus sign, a minus sign, a multiplication sign, and a division sign. The elements are arranged in a pattern that suggests a focus on mathematics.

Aims for this session

- To share curriculum expectations
- To understand the skills and expectations needed at KS1
- To identify strategies that can support home learning in number
- To explore how the Concrete, Practical, Abstract approach supports learning
- To share the Bar Modelling approach for problem solving

Curriculum expectations

- The national curriculum for mathematics aims to ensure that all pupils:
 - become **fluent** in mathematics
 - 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 **non-routine** problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

Skills in Maths and across the curriculum

- Use Mathematical vocabulary
- Explain ideas and evaluate outcomes
- Make connections
- Use fluency and recall
- Predict and Justify
- challenge ideas
- Work systematically
- Trial and improvement
- Logical thinking
- Be independent
- Learn from mistakes
- Collaborate with others
- Spot patterns
- Show resilience
- Correct mistakes



Expectations by the end of Year 1

Place Value and
Rounding

Addition and
Subtraction

Multiplication
and Division

Fractions

Measurement

Geometry –Shape,
Position and Direction



I can use the language of equal to, more than, less than, fewer, most and least

I can subtract a two digit number within 20

I can halve even numbers within 20

I can solve simple problems involving a half

I can find one more or 1 less of a given number

I can add two digit numbers to 20 including zero

I can divide by using objects (group small amounts)

I can find and name quarter of a quantity

I can count in multiples of 5 and 10

I can subtract a one digit number within 20

I can solve simple multiplication problems

I can find and name quarter of a shape

I can identify and represent numbers using objects and pictures including a number line

I can add one digit numbers to 20 including zero

I can show multiplication using pictures (e.g. drawings and number lines)

I can find and name quarter of an object

I can count in multiples of 2

I can show and use subtraction facts within 20

I can show multiplication using arrays

I can find and name half of a quantity

I can count, read and write numbers to 100

I can show and use number bonds to 20

I can double single digit numbers

I can find and name half of a shape

I can count to and across 100 forwards and backwards

I can read, write and understand calculations with +, - and = signs

I can multiply using objects (group small amounts)

I can find and name half of an object

Place Value and

Addition and

Multiplication

Fractions

I am beginning to measure and record mass and weight

I can recognise and know the value of coins and notes

I can compare, describe and solve practical problems for capacity and volume (such as full, empty, more than, less than, half full and quarter)

I can compare, describe and solve practical problems for time (such as quicker, slower, earlier and later)

I am beginning to measure and record capacity and volume

I can tell half past the hour times and draw the hour and minute hands on a clock face

I can compare, describe and solve practical problems for mass/weight (such as heavy, light, heavier than and lighter than)

I can tell the time to the hour and draw the hour and minute hands on a clock face

I can describe position, direction and movement including whole, half, quarter and three-quarter turns

I can compare, describe and solve practical problems for lengths and heights (such as long, longer, short, shorter, double and half)

I know and use words relating to dates such as days, weeks, months and years

I can recognise and name 3-D shapes (such as cuboids, including cubes, pyramids and spheres)

I am beginning to measure and record lengths and heights

I can sequence events in order using words such as before, after, first, next, today, tomorrow, morning, afternoon and evening

I can recognise and name 2-D shapes (such as rectangles, including squares, circles and triangles)

Measurement

Measurement

Geometry –Shape,
Position and Direction

Expectations by the end of KS1

Key stage 1 – years 1 and 2

The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources [for example, concrete objects and measuring tools].

At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.

Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

Year 1 programme of study

Number – number and place value

Statutory requirements

Pupils should be taught to:

- count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
- count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens
- given a number, identify one more and one less
- identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least
- read and write numbers from 1 to 20 in numerals and words.

Year 1 programme of study

Number – number and place value

Statutory requirements

Pupils should be taught to:

- count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number

Arrange 20 counters or cubes in a line. If I count in 2s from the number 8, will I say number 11?

Compare amounts.

What's the same? What's different?

Children compare the bead strings and notice:

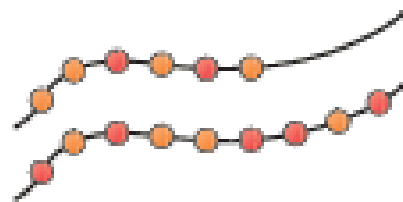
One has 9 beads and the other has 6 beads.

9 is 3 more than 6.

6 is 3 less than 9.

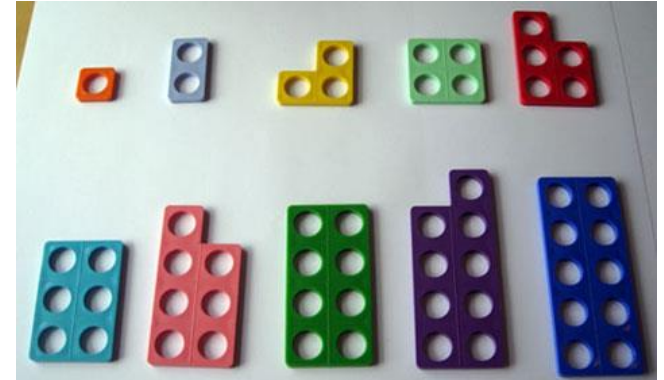
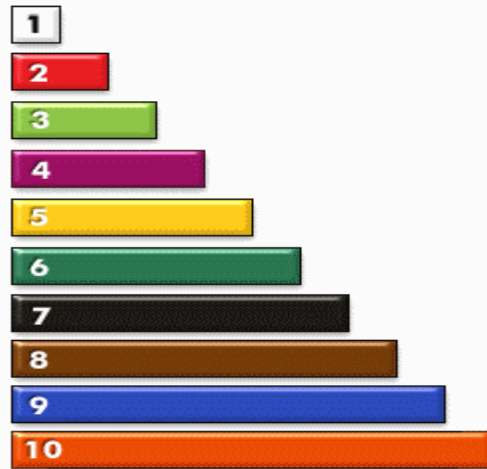
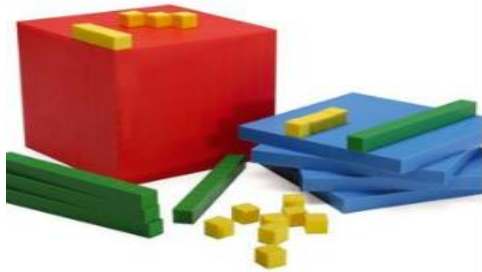
Pupils should be able to successfully respond to questions such as:

- Count forwards from 36, etc.
- Point to the third object in the line.



The
number 19
is one less
than
_____?

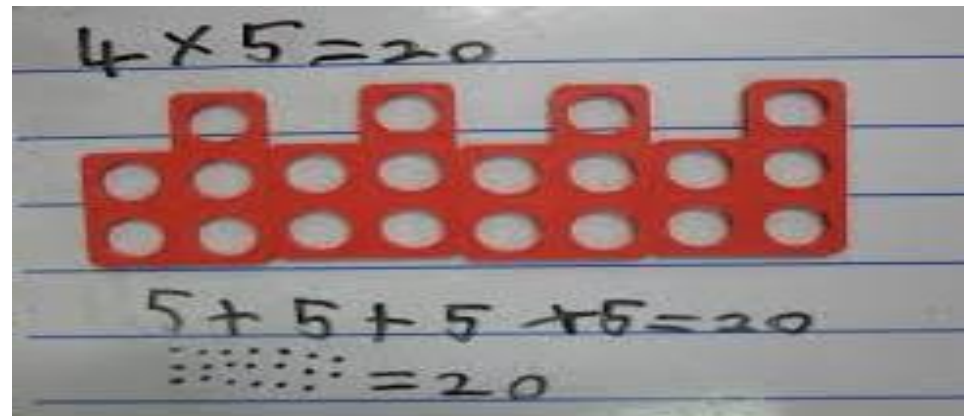
Manipulatives used in class to support understanding



Strategies to support home learning in Number

- Multiplication games:
- Using concrete objects (including everyday objects) such as pencils, coins, multilink cubes, Numicon tiles or tokens , show your child how times tables are made of groups, e.g. 1 group of 4, 2 groups of 4, 3 groups of 4, etc.
- Singing times tables songs (x2,x5 or x10) with modern pop songs

https://www.youtube.com/playlist?list=PLb7Q5jsm9eh_fdDPQmVpyp4XRu-raUbHc



Strategies to support home learning in Number

- ▶ Play a mystery game with your child using a feely bag 'Which multiplication am I?' e.g pull out 10 cubes and organise into 2 groups. Ask your child to say the number sentence and then write it eg $10 \times 2 = 20$
- ▶ Using concrete objects on your table, a feely bag and dice. Without looking in the bag, ask your child to pull out either 2 concrete objects, 5 or 10. Now roll the dice eg your child pulls out 5 cubes and rolls the dice to reveal 3. This becomes 5×3 . Your child needs to show 5, 3 times with that object (3 groups of 5).

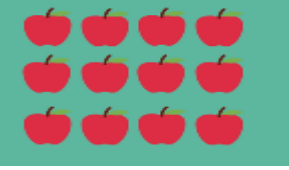
Have a go at this with someone on your table:

- ▶ **Using any objects on your table, show 5 lots of 3. Now show 3 lots of 5. What might your child find tricky?**



Expectations by the end of Year 1

I can show multiplication using arrays



I can double single digit numbers

I can multiply using objects (group small amounts)

Multiplication and Division



Arrays are a pictorial representation to help children understand times tables. For example, a child may be given the following word problem:

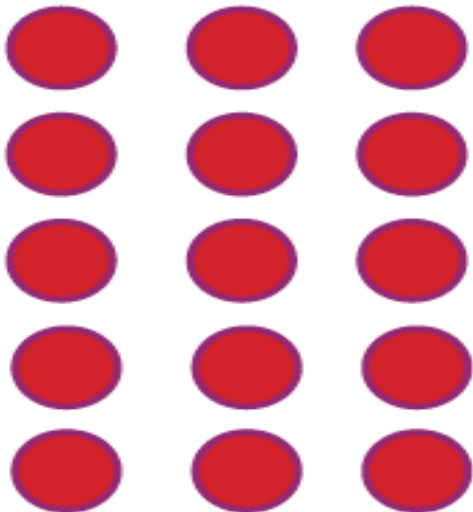
I have 3 bags. There are 5 pennies in each bag. How many pennies do I have altogether?

Have a go at using the Maths manipulatives on your tables to create an array to help solve the problem

Strategies to support home learning in Number

I have 3 bags. There are 5 pennies in each bag. How many pennies do I have altogether?

A teacher might show the children that the first bag has five pennies and draw the five pennies in a line. Then they would explain that the second bag also has five pennies, and draw a second line. They would continue until they had drawn 3 lines of 5 pennies like this:



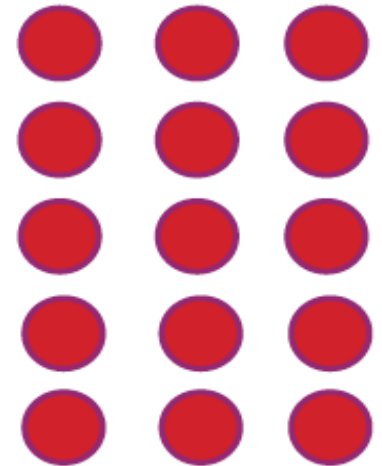
Strategies to support home learning in Number

I have 3 bags. There are 5 pennies in each bag. How many pennies do I have altogether?

The teacher might then explain that rather than counting all the pennies individually, you could work out the answer by counting each line in 5s. The teacher could then point to each line and count 5, 10, 15 to show the children that there were 15 pennies in all.

Teachers in Key Stage 1 will teach children how to count in 2s, 5s and 10s and make sure they are very confident in this, before going on to show them how to work out times table problems like this one using arrays.

This is because children need to be able to count up in steps of different numbers before they can use arrays to help them.



Y1

Through practical activities in meaningful contexts and informal written methods.

- Recall number bonds to 20 and within 20.
- Pictures and Marks – 1 more / 2 more.
There are 3 cars in the garage. 1 more came along.



$$3 + 1 = 4$$

$$4 + 1 = 5$$

Terry has 3 apples and Tony has 2 apples. How many altogether?

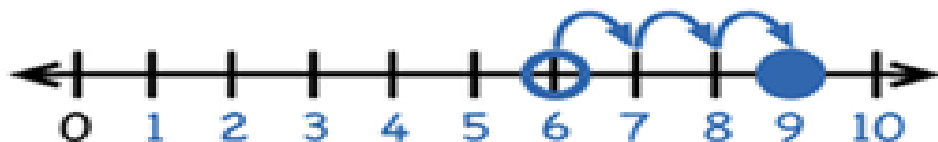


+



- Number lines to 20.

$$6 + 3 = 9$$



- Derive related facts to 20.

$$\square = 5 + 4$$

$$5 + 4 = \square$$

$$\square + 4 = 9$$

$$\square + \square = 9$$



- Money and addition up to 20p.

- Read, write and interpret mathematical statement involving addition (+) and equals (=).

Video clips:

[Using a range of equipment and strategies to reinforce addition statements](#)

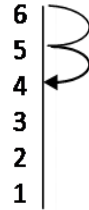
National Curriculum requirements:

Add 1 digit and 2 digit numbers to 20, including 0.

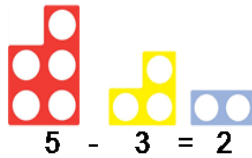
Through practical and meaningful contexts and informal written methods.

- We made 6 cakes. We ate 2 of them.

How many cakes are left?



- Link to vertical number line $6 - 2 =$



- Find the difference within 20.
- Represent and use number bonds within 20.
- Record using subtraction ($-$) and equals signs ($=$)
- Derive related facts up to 20.

$$\begin{array}{ll} 5 - 2 = \square & \square = 5 - 2 \\ 5 - \square = 3 & 3 = \square - 2 \\ \square - 2 = 3 & 3 = 5 - \square \\ \square - \square = 3 & 3 = \square - \square \end{array}$$



- Counting back on a 100 square and a vertical number line.

National Curriculum requirements:

Subtract 1 digit and 2 digit numbers up to 20, including 0.

Represent and use number bonds and related subtraction facts.

Concrete, pictorial, abstract approach

Concrete

Actual objects to illustrate the problem

Generic concrete

Materials such as multilink & Cuisenaire, post it pads.

Pictorial representations

Individual squares, joined squares and then rectangular bars

Abstract

Written methods

Build it ... Draw it... Write it.....Say it.

Concrete, pictorial, abstract approach

Cem has 3 cars. Maya gives him 1 more car. How many cars does Cem have altogether ?



Cem has _____ cars altogether.

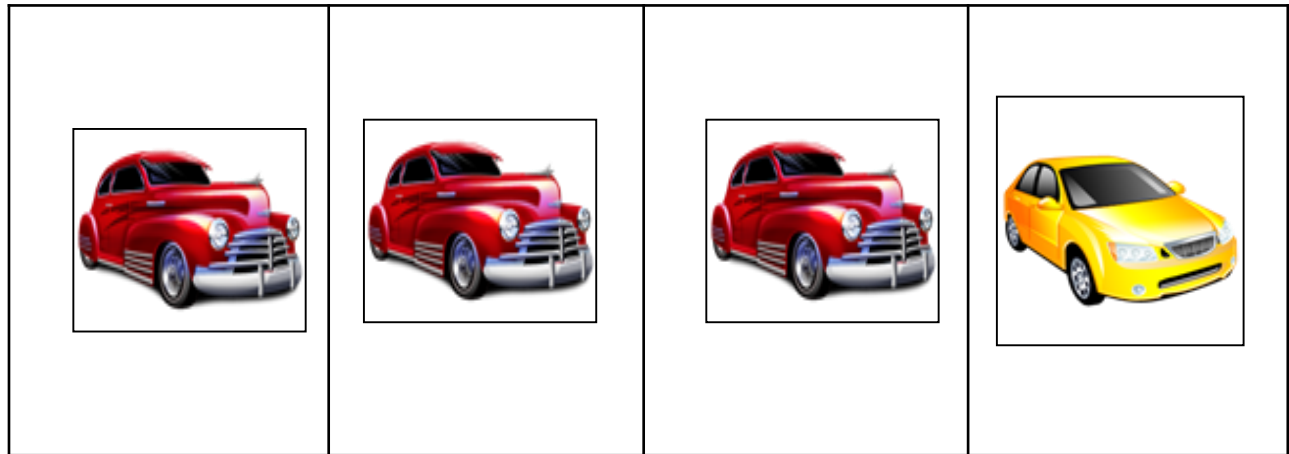
Concrete (practical)
Discrete

Have a go at using the concrete objects on the table to illustrate the problem in groups

Now draw it using pictorial representations
Individual squares, joined squares and then rectangular bars on post it notes

Finally, how would this be recorded as a written method?

Cem has 3 cars. Maya gives him 1 more car. How many cars does Cem have altogether ?

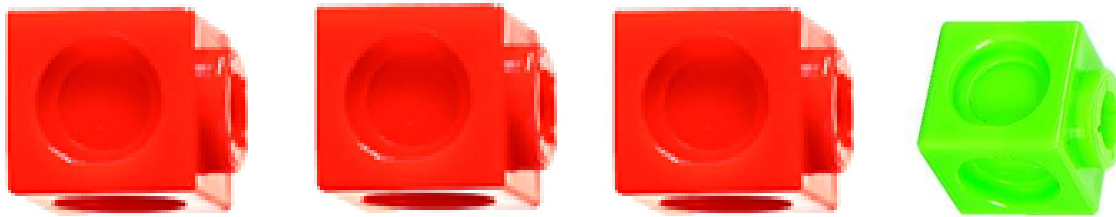


Cem has _____ cars altogether.

Concrete (practical)

Discrete - part

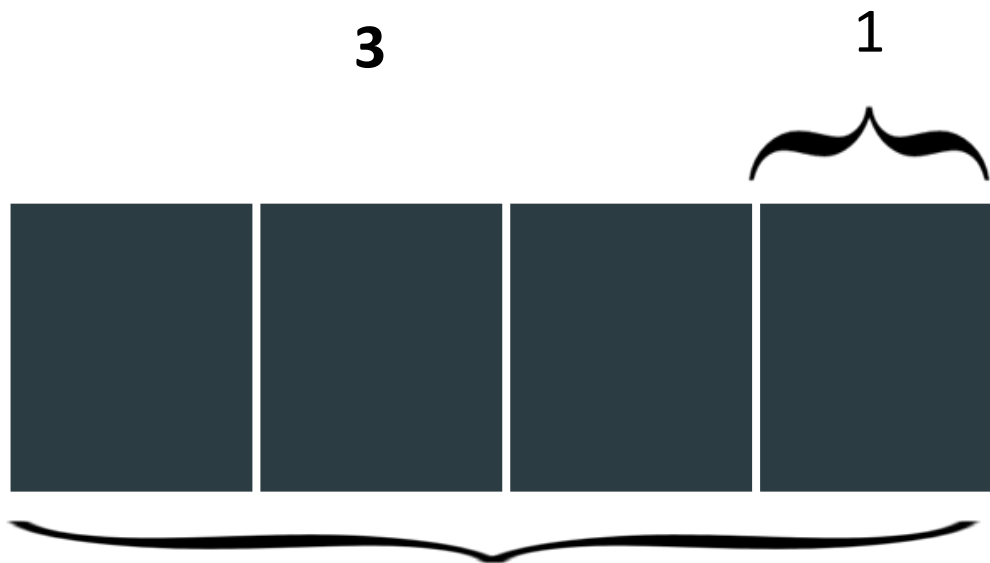
Cem has 3 cars. Maya gives him 1 more car. How many cars does Cem have altogether ?



Cem has _____ cars altogether

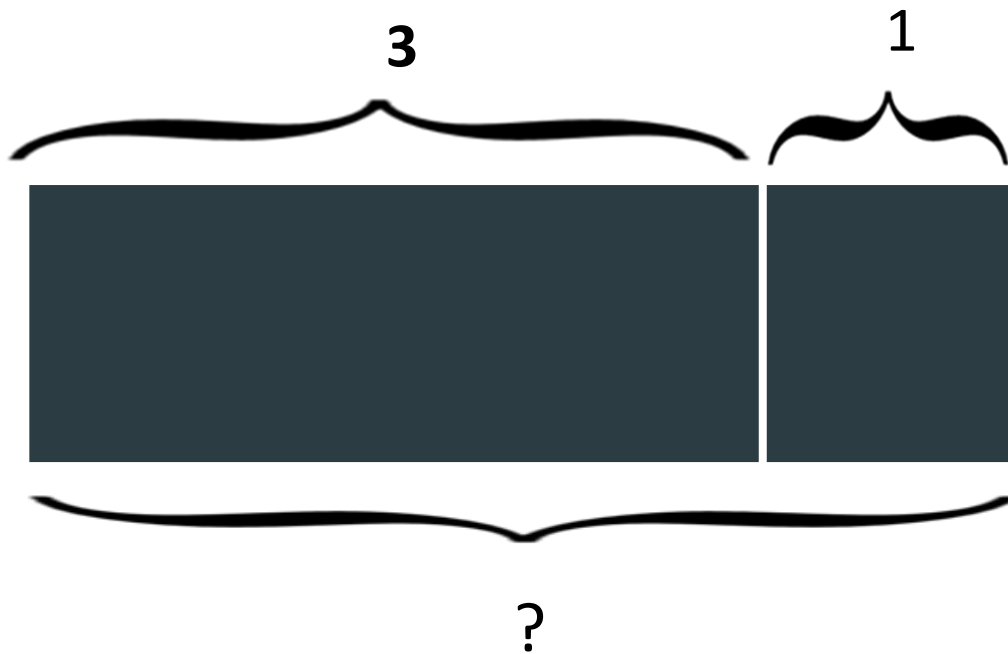
Generic concrete practical

Cem has 3 cars. Maya gives him 1 more car. How many cars does Cem have altogether ?



Cem has cars altogether.

Cem has 3 cars. Maya gives him 1 more car. How many cars does Cem have altogether ?



Cem has _____ cars altogether

Using the CPA approach

How could we apply the CPA method to this problem?

Jon has 10 marbles. Harry gives Jon 12 more marbles.
How many marbles does Jon have now?

Jon has ___ marbles.



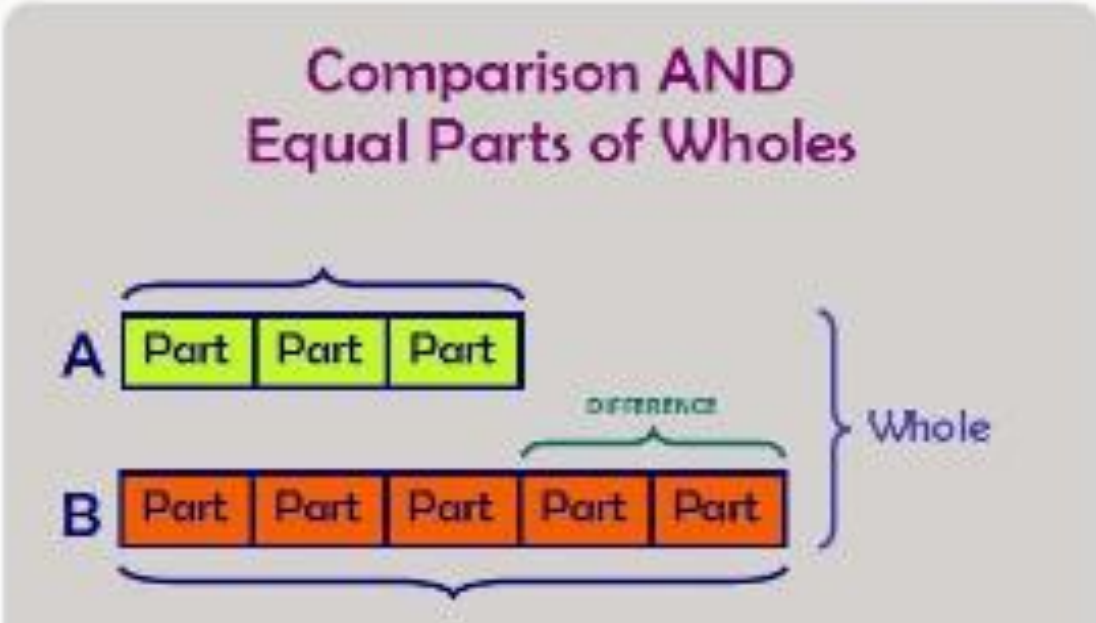
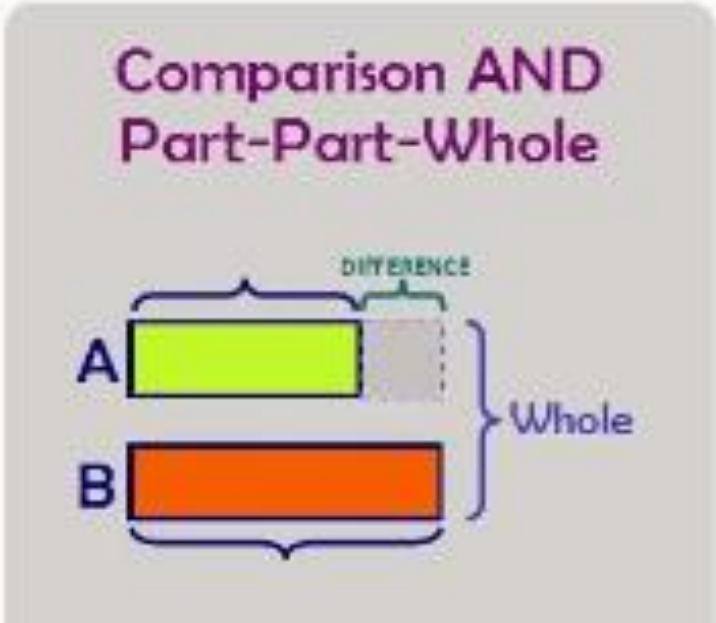
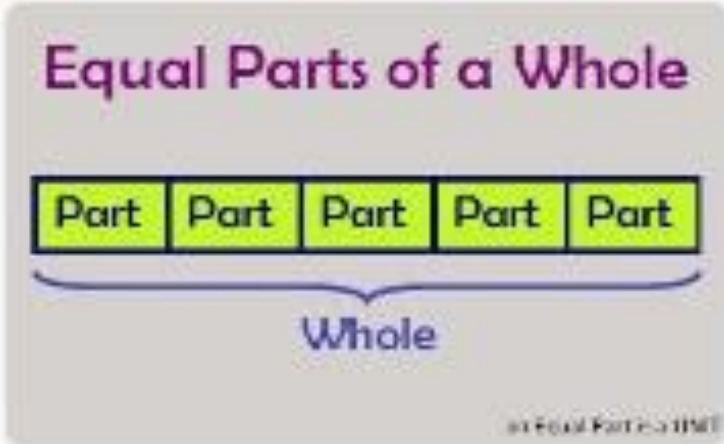
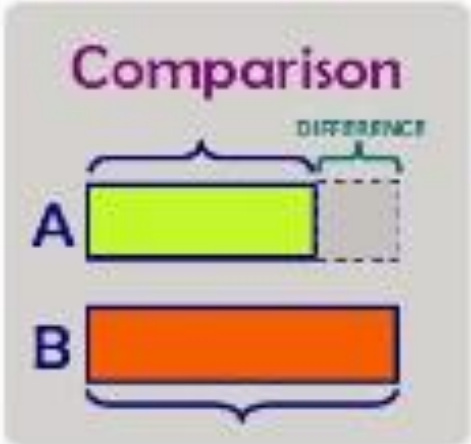
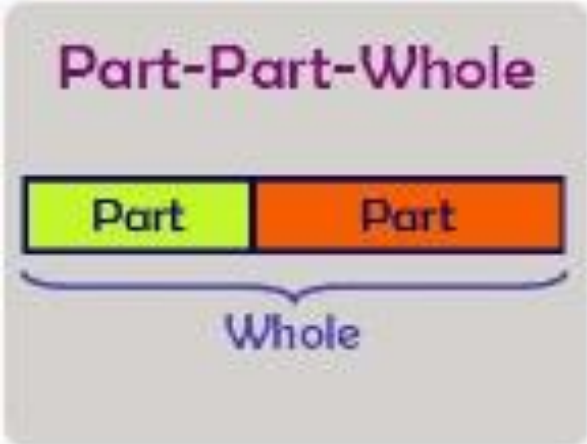
Concrete to pictorial to abstract



$$10 + 12 = 22$$

Jon has _____ marbles altogether

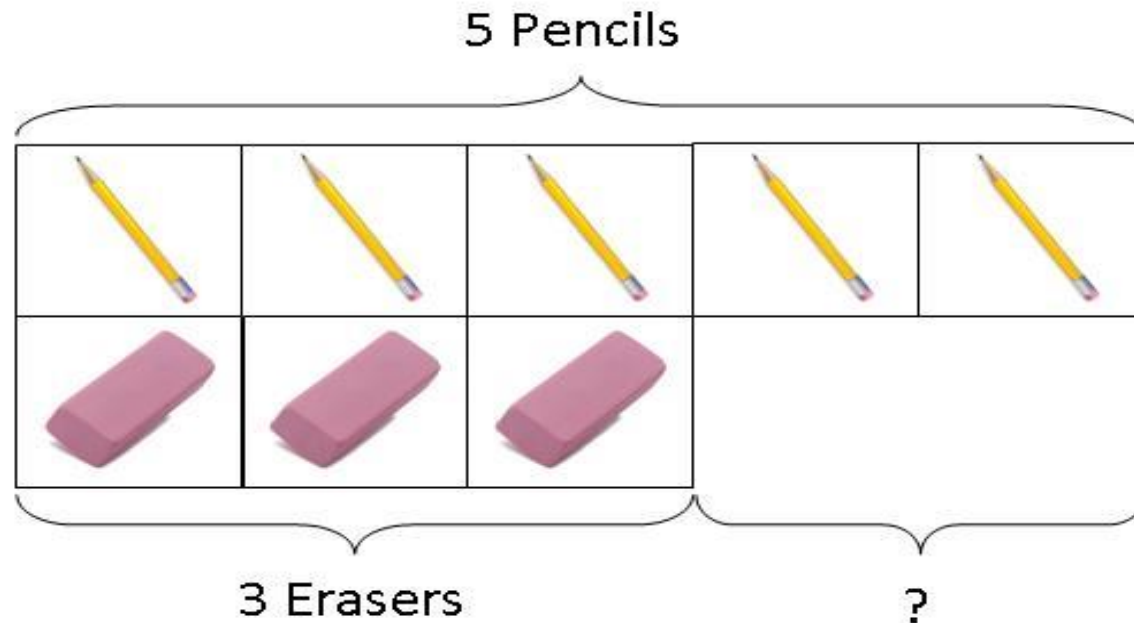
Bar modelling for problem solving as part of CPA approach



Subtraction/difference: Comparison Model

Zeenat has 5 pencils and 3 erasers.

How many more pencils than erasers does she have?

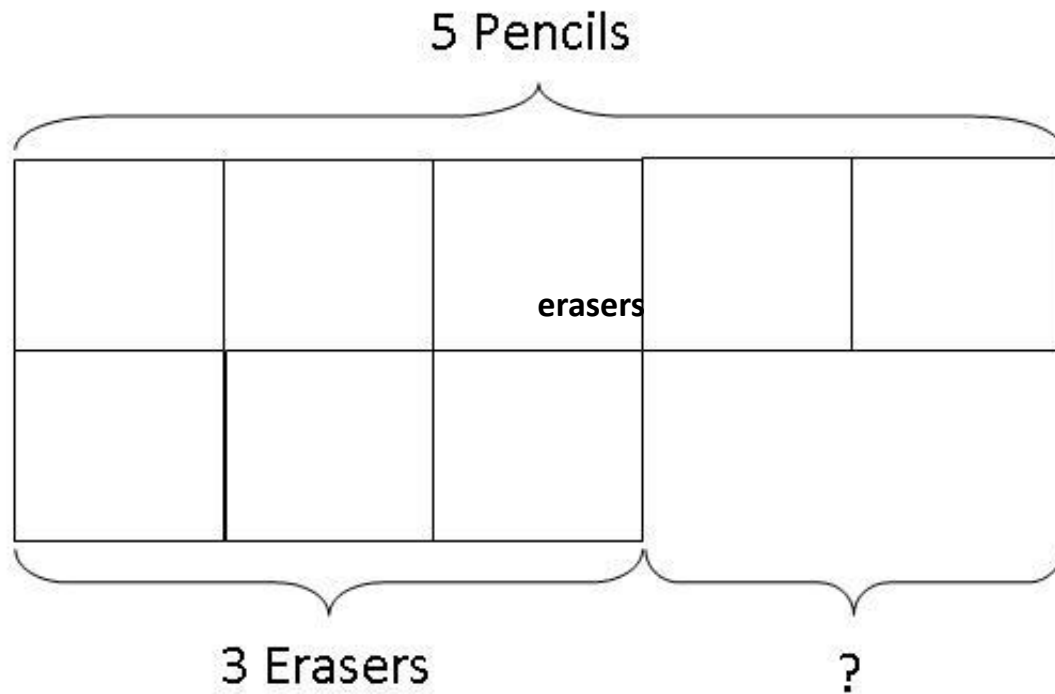


Zeenat has more pencils than erasers.

Moving to the abstract

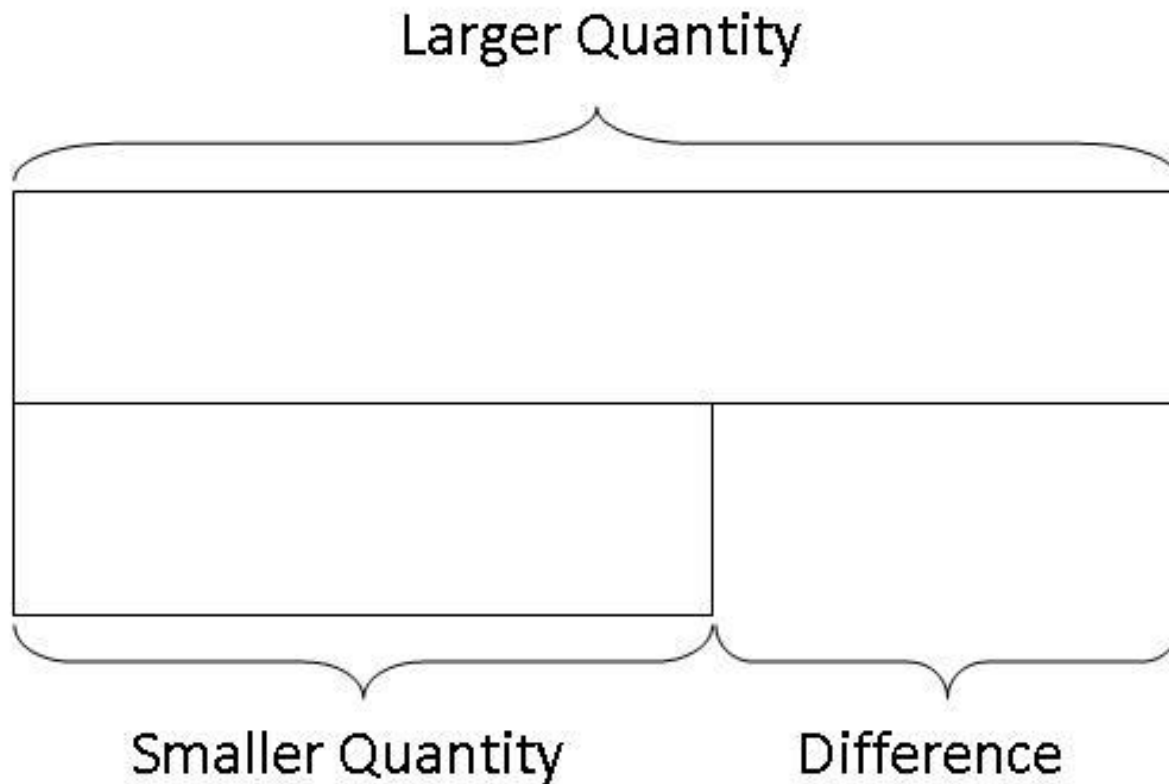
Zeenat has 5 pencils and 3 erasers.

How many more pencils than erasers does she have?



Zeenat has ___ pencils than erasers.

Generalisation



Now solve this using bar model

Terry had 4 apples and Anisha had 6 apples. How many more apples does Anisha have?

Use the CPA approach to solve.





Early multiplication

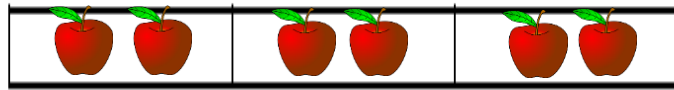
There are two apples in each bag.

There are three bags.

How many apples are there altogether?



Early multiplication



There are ___ apples together.

What are the stages in progression?

Try these using bar models

The farmer has 24 animals There are three times as many sheep as cows.

How many Sheep does the farmer have?

How many cows does the farmer have?

Language of Maths

- +, plus, add, how much more is.....?
- - , subtract, minus, how much less is.....?
- Half, halve
- =, equals, sign, tens, ones
- Counting up
- Number sentences
- Digits
- Double, halve, share, left over,
- Near doubles
- Count in 2s,5s and 10s
- Groups of

Mastery v Acceleration

shallow mastery

promotes procedural learning at the expense of deep understanding



shallow acquaintance can also lead to learners feeling insecure

leads to apparent success without students developing the depth and tenacity that is needed for long-term progression.

ICT Games to support learning

www.ictgames.com/soccer_subtraction.html

www.ictgames.com/football2.html

www.ictgames.com/airlineGrouping/index.htm

www.ictgames.com/airlineGrouping/index.htm

www.ictgames.com/arrowCards_revised_v6.html

Thank you for coming

**I kindly ask that the resources
be placed back into their
pouches for the next parent
workshop please.**