Maths Information Evening

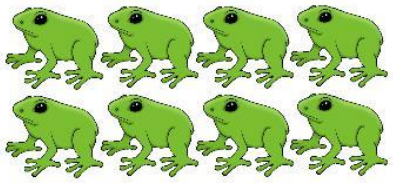
Resilience
Creativity
Kindness
Resourcefulness
Statutory NC
P4C
TASC
Outdoor learning

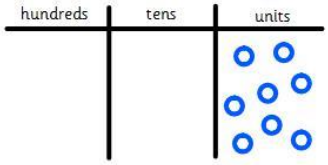
KS1

N

Outline for session

- Concrete, pictorial, abstract
- Conceptual variation
- Number fluency
- Learning at home
- Any questions?





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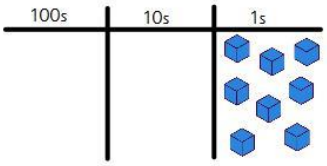
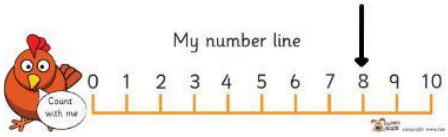




Which is the most meaningful to you?

R

What is concrete, pictorial and abstract?

"If we do not use concrete manipulations, then we cannot understand mathematics. If we only use concrete manipulations, then we are not doing mathematics."[2]

Gu (2015)

Concrete – Children use practical apparatus such as base 10, place value counters, Cuisenaire rods, Numicon and plastic coins to complete calculations. The main focus is to investigate new concepts and ideas, develop an understanding of the place value of numbers and recognise links to prior learning.

Pictorial – Children draw images of practical apparatus to encourage them to begin developing mental pictures of calculations and visualise the calculation. Children make links between concrete and abstract representations.

Abstract – Children represent prior learning using mathematical symbols. They consolidate the understanding formed through concrete and pictorial investigation and use digits and symbols to represent calculations.

R/M

What manipulatives do we use in school?

Numicon

Base 10

2d and 3d shapes

Cubes

Compare bears

Clocks

...and lots more!

What are the advantages of using manipulatives?

- Children show better retention rates compared to just using abstract symbols (Carbonneau, Marley and Selig 2013)
- Reduces cognitive demand on pupils (Moyer 2001)
- Children develop deeper understanding of concepts (Ofsted 2012)
- Reduces an over-reliance of mathematical rules (National Centre for the Excellence of Teaching Mathematics 2003)
- Helps address and overcome misconceptions (Drews 2007)

K

Thirteen Thirty

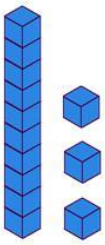
30 31

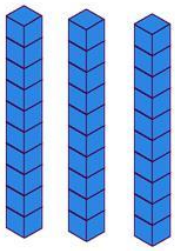
13

K

Thirteen

Thirty





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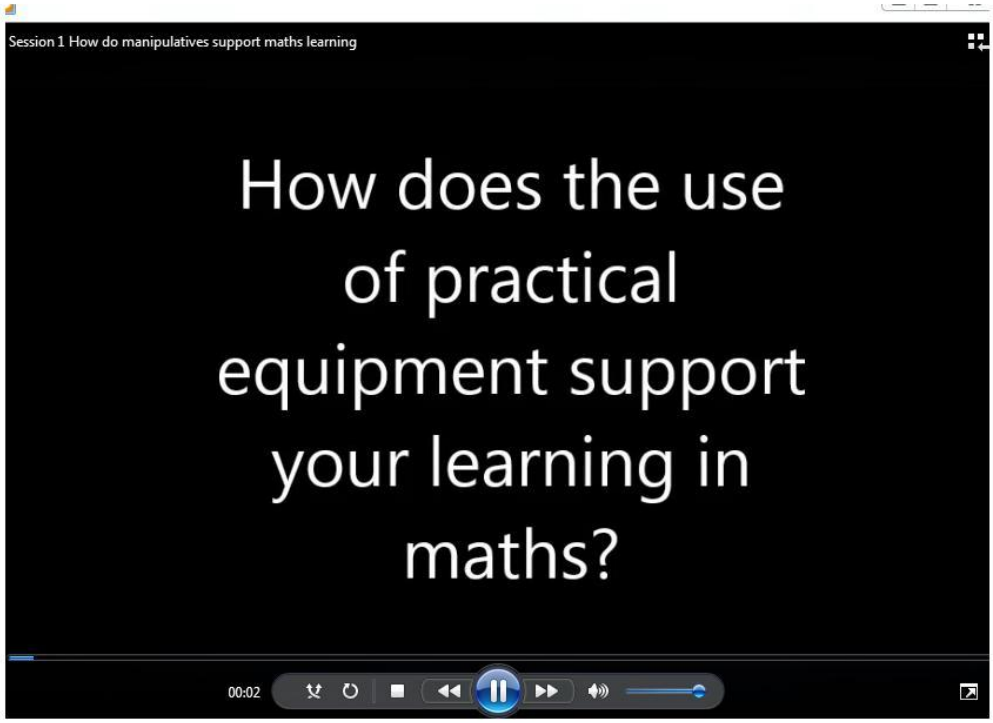
Session 1 How do manipulatives support maths learning
How does the use of practical equipment support your learning in maths?
00:02

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Conceptual variation

How is maths learning developed over time?

N

How is maths learning developed over time?

How is maths learning developed over time?

N

How is maths learning developed over time?

Are these chairs?

K

Conceptual variation

Supports children with recognising a concept in any context.

Helps children understand what something is and what it isn't.

Reflects on the questions:
What is the same? What is different?

Show it!
Prove it!
Apply it!
Detect it!
Explain it!

M

Number fluency

3 + 7 = 10

2 + 2 = 4

10 x 3 = 30

18 + 2 = 20

M

Why is number fluency important?

- Number fluency reduces cognitive load (Chinnappan & Chandler 2010)
- Number fluency increases efficiency and accuracy (National Centre for the Excellence of Teaching Mathematics 2014)

R

What does it look like?

In every lesson, children are encouraged to use number fact recall e.g. number bonds to 10.

Lots of opportunity for number fluency practise is included through careful choice of numbers when planning.

Number fluency facts are incorporated into daily routines and transitions.

$$7 + 3 + 1 =$$

S

Maths Non-Negotiables

	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Autumn 1	Say the number names in order to 5	Know all addition number bonds to 10	Know all number bonds to 20	Know multiplication and division facts for 4 times table	Know multiplication and division facts for 9 times table	Know all decimals that total 1 or 10 (1 decimal place)	Know all decimals that total 1 (2 decimal place)
Autumn 2	Begin to recognise the days of the week	Know the days of the week and months of the year	Know all double and halves within 20	Know multiplication and division facts for 8 times table	Know multiplication and division facts for 12 times table	Know metric conversion facts e.g. 1kg = 1000g	Use all multiplication and division facts to derive x and ÷ of small multiples of 10 and 100 (e.g. 30 x 900; 8100 ÷ 9)
Spring 1	Say the number names in order to 10	Know all addition number bonds within 10	Know multiplication and division facts for the 10 times table	Consolidate 2s, 5s, 10s, 3s, 4s and 8s times tables	Know multiplication and division facts for 7 times table	Know the doubles and halves of all two-digit numbers	Use multiplication and division facts to multiply and divide decimals (e.g. 1.2 x 8 =)
Spring 2	Partition numbers to 5 into two groups	Know addition and subtraction facts for all numbers within 10.	Know multiplication and division facts for the 2 times table	Know multiplication and division facts for 6 times table	Consolidate multiplication and division facts up to 12 x 12	Know pairs of factors of numbers up to 100	½, ⅗, tenths and fifths
Summer 1	Count forward and backwards in ones from any number up to 10	Know all doubles and halves to 10	Know multiplication and division facts for the 5 times table	Know multiplication and division facts for 11 times table	Consolidate multiplication and division facts up to 12 x 12	Know the decimal and percentage equivalents of the fractions ½, ¼, ¾	Know the prime numbers within 50
Summer 2	Count forwards and backwards in ones from any number up to 20	Count forwards and backwards in ones from any number up to 100.	Know multiplication and division facts for the 3 times table	Consolidate 2s, 5s, 10s, 3s, 4s, 8s, 6s, and 11s times tables	Consolidate multiplication and division facts up to 12 x 12	Know square numbers and square roots to 12 x 12	Know the doubles and halves of all multiples of 100 to 10,000

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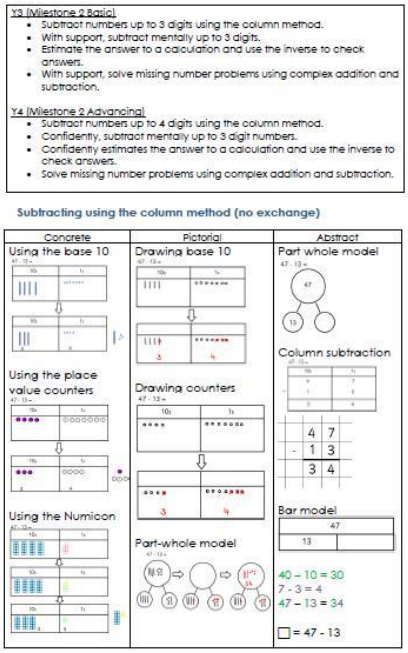
How can I support my child's learning at home? (calculation policy)



Y3 (Milestone 2 Basic)
- Subtract numbers up to 3 digits using the column method.
- With support, subtract mentally up to 3 digits.
- Estimate the answer to a calculation and use the inverse to check answers.
- With support, solve missing number problems using complex addition and subtraction.

Y4 (Milestone 2 Advancing)
- Subtract numbers up to 4 digits using the column method.
- Confidently, subtract mentally up to 3 digit numbers.
- Confidently estimates the answer to a calculation and use the inverse to check answers.
- Solve missing number problems using complex addition and subtraction.

Subtracting using the column method (no exchange)

Concrete	Pictorial	Abstract
Using the base 10	Drawing base 10	Part whole model
Using the place value counters	Drawing counters	Column subtraction
Using the Numicon	Part-whole model	Bar model

40 – 10 = 30
7 - 3 = 4
47 – 13 = 34
□ = 47 - 13

Split into 4 key calculation sections:

-Addition
-Subtraction
-Multiplication
-Division

Linked to learning in specific year groups.

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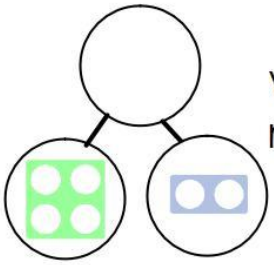
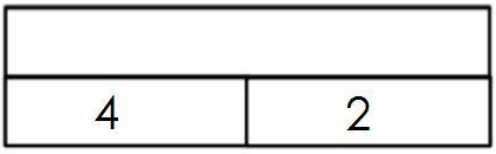
Key models

Tilly has 4 rubbers. Her friend buys her 2 more.
How many does she have altogether?

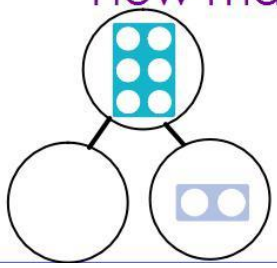


part
whole
model

bar model

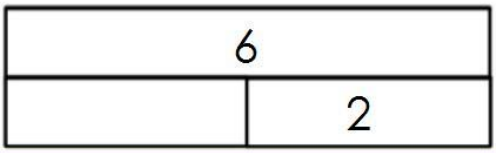


Poppy had 6 pens but she gave 2 pens away.
How many does she have now?



part
whole
model

bar model



How can I support my child's learning at home?

Hit the button

Times table rockstars (Y2 from Christmas)

Everyday life - making maths meaningful

Any questions?