







Aim High	Work Together	Be Kind	Lead the Way
			

Welcome to Coffee Morning
19/05/2021



Primary Calculation Policy



Progression in calculations

Year 1 – Year 6*



What is a calculation policy?

- shows **progression in maths** across the school
- **outlines strategies used** to teach content of the National Curriculum
- shows how previous **learning is built on and how maths learning progresses** through primary



Why do schools have them?

- ensures pupils are taught **consistent methods**
- ensures pupils are taught using **effective, recognised methods**
- ensures **teaching is aligned** across the school



How do we use them?

- **build on learning** from previous year groups
- shows **parents and carers** which methods are being taught in school so they **can help their children**

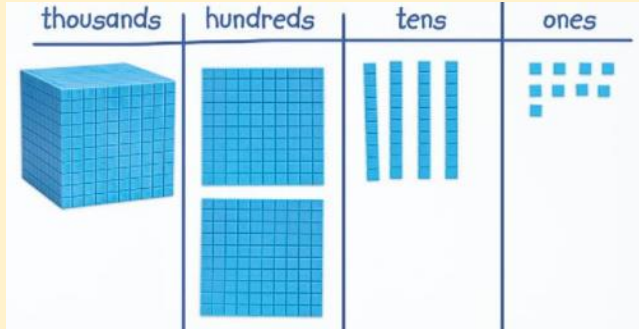


Let's look at some of the
strategies from the policy



Year 2 – column method addition and subtraction using Dienes representations

$$358 + 37$$







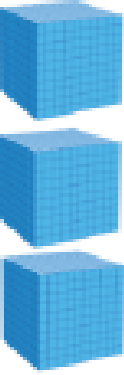
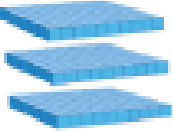


	hundreds	tens	ones
	3	5	8
+		3	7
	3	9	5

hundreds	tens	ones
		
		
		


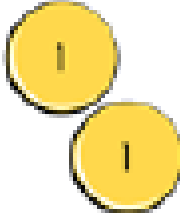

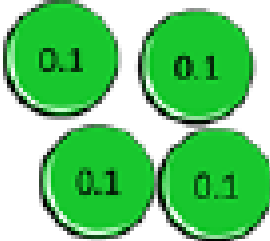



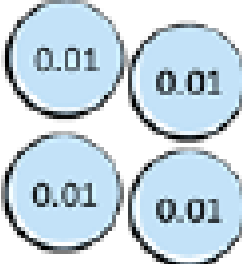


Year 4 – multiplying by 10, 100 and 1,000 using Dienes representations

thousands 	hundreds 	tens 	ones 	
		 3	 3	$3 \times 10 = 30$
 3	 3	0	0	$3 \times 100 = 300$
3	0	0	0	$3 \times 1000 = 3000$

Year 6 – multiplying decimals by 10, 100, 1,000 using place value counters

$$302.14 \times 10$$

Thousands	Hundreds	Tens	Ones	•	tenths	hundredths
				•		
				•		



KS1 and 2 – how to support your children

➤ Use **calculation policy** and year group **key representations** to help your child with their homework



Progression in calculations

Year 1 – Year 6*

Year 2 Key Representations
Find out more...

Watch the Unit tutorial before planning each unit.
Read the planning guide for suggestions of representations.
Make use of PD videos on unit pages and Progression in Calculations page.

Representations of number
Pupils have primarily used counters, cubes and other discrete objects to represent number. Cubes have been used to support the process of regrouping – one ten is equal to ten ones. A ten frame supports this alongside number bonds for 10. Both are used to represent ten numbers.
One ten is regrouped for ten ones. Ten ones is regrouped for one ten.
17 is one ten and seven ones.

Number lines
Number lines can be used to represent and compare numbers and can be used alongside a bead string. They demonstrate the continuous nature of the number system. Pupils have ordered numbers on a number line.

Equations
The phrase 'is equal to' is used consistently to refer to the = symbol. What is on one side of the symbol is equal to what is on the other side. Present equations in different ways to support this:
 $7 = 3 + 4$
 $3 + \square = 7$

Number bond knowledge
Pupils should be increasingly fluent in number bond recall for all numbers to 10 and use representations to consider commutativity.

Deriving facts
Pupils use known facts such as number bonds and understanding of place value and magnitude to derive further facts. Commutativity for addition is also used.
If I know $3 + 4 = 7$ then I know $4 + 3 = 7$
If I know $3 + 4 = 7$ then I know $13 + 4 = 17$
If I know $3 + 4 = 7$ then I know $4 + 3 = 7$

Comparing numbers
Pupils have experienced a range of language to compare numbers.
Five is less than seven. Five ones is fewer than seven ones.
Seven is greater than five. Six is between five and seven. It is after five and before seven.

Part-whole language and representations
A part-whole model is used to represent the relationship between numbers and will have been used for addition and subtraction. The model is made of a whole and two or more parts.
The whole is ten. One part is six and one part is four. Six plus four is equal to ten.
whole = part + part
 $10 = 6 + 4$
By moving the manipulatives the model represents subtraction. Care should be taken to ensure connections between the movement of the manipulatives: I subtract one part of six. I am taking away one part of six.
The whole is ten. I subtract one part of six. The missing part is four. Ten subtract six is equal to four.
= part + part
 $10 = 6 + 4$

The 'make 10' strategy
Pupils apply number bonds to 10 to calculate how many more/less to the next multiple of ten. They partition the part into two parts to calculate mentally. Using concrete or pictorial representations can scaffold thinking.
 $8 + 6 = 7$ know eight and two make 10 so I can partition six into two and four.

Ten more / ten less
Pupils have explored ten more and ten less than numbers within 50 using manipulatives. They also skip count on and back in tens from different starting points. Mental recall of this can be developed in Maths Meetings.

Finding the difference
Pupils recognise that in a subtraction calculation where the numbers are close together in value, a count on strategy can be used to find the difference.
 $32 - 25 = 7$ I can count on from 25 to find the difference. Five more is 30, two more is 32. The difference is seven.

Representing fractions
Pupils identify half and quarter of a shape and a quantity within 20 using practical experiences including equal sharing for a quantity. They are also familiar with half turns, linking this to half past on a clock face.
One half is one of two equal parts.
One quarter is one of four equal parts.
One quarter of eight is two.
Half of six is three.

Doubling and halving
Pupils have had opportunities to represent doubling and halving within 20 using concrete and pictorial representations. This is connected to their understanding of half. Some facts will be recalled.
Double three is six. Three plus three is equal to six.
Half of six is three. Six take away three is equal to three.

Division by sharing / grouping
Pupils have been exposed to the concept of division within 20 through equal grouping and equal sharing. They have also explored unequal grouping and sharing. Pupils should explore the terms grouping and sharing and be familiar with both.

KS1 and 2– how to support your children

- Encourage them to use Times Tables Rockstars



KS3– moving from **concrete** to **abstract**

$$52 \times 31$$

	50	2
30	1500	60
1	50	2

$$\begin{array}{r}
 ^1 \\
 1500 \\
 60 \\
 50 \\
 2 \\
 \hline
 1612 \\
 \hline
 \end{array}$$

$$(x + 4)(x + 1)$$

	x	$+4$
x	x^2	$4x$
$+1$	x	4

$$\begin{aligned}
 &(x + 4)(x + 1) \\
 &= x^2 + 4x + x + 4 \\
 &= x^2 + 5x + 4
 \end{aligned}$$

KS3– moving from **concrete** to **abstract**

Find the range of values of x which satisfy

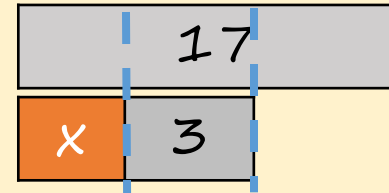
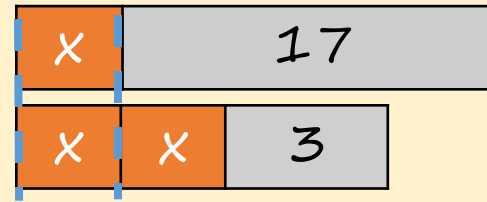
$$2x + 3 < x + 17$$

$$-x \quad \downarrow \quad -x$$

$$x + 3 < 17$$

$$-3 \quad \downarrow \quad -3$$

$$x < 14$$



KS3 – more focus on problem solving

Find the mean of these numbers:

2, 3, 4, 6, 10

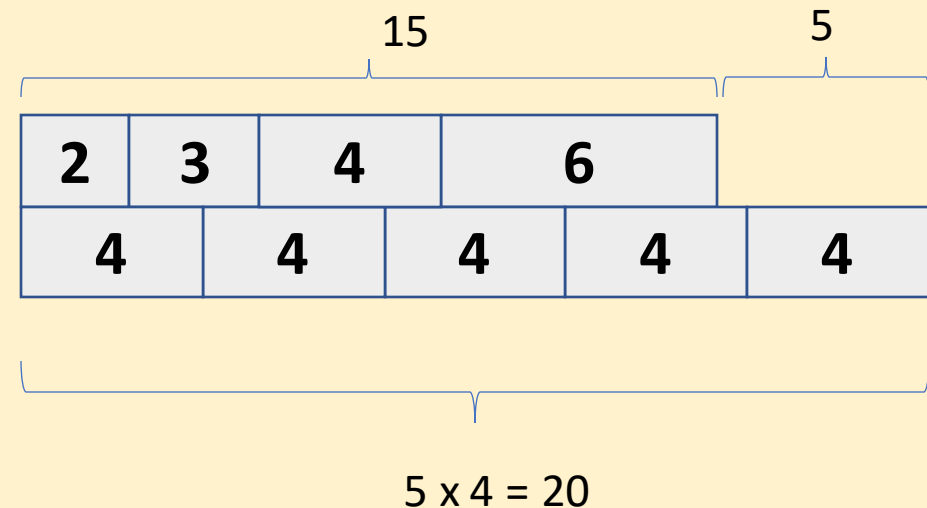
$$\frac{2 + 3 + 4 + 6 + 10}{5}$$

$$= \frac{25}{5} = 5$$

2	3	4	6	10
5	5	5	5	5

These five numbers have a mean of 4.
Find x.

2, 3, 4, 6, x





KS3– how to support your children

Reading at home

A bonus of £2100 is shared by 10 people who work for a company.
40% of the bonus is shared equally between 3 managers.
The rest of the bonus is shared equally between 7 salesmen.

One of the salesmen says,

“If the bonus is shared equally between all 10 people I will get 25% more money.”

Is the salesman correct?

You must show how you get your answer.



KS3– how to support your children

Hegarty Maths



- Your children are usually set 2 or more Hegarty homeworks per week
- Ask to see their score! They should be getting over 80% and should watch the video & retake the quiz if they are stuck
- A great way to revise and consolidate