



Shoreham Beach
Primary School

Maths workshop 1: Concepts and language

18TH NOVEMBER 2024

Why are we here?

- ▶ The way maths is being taught is fundamentally changing
- ▶ Because your children's experience of maths at primary school will be very different to yours
- ▶ To give you ways of communicating with your children about maths
- ▶ To begin to help support you in supporting them at home



Why listen to me?

- ▶ NCETM Primary Teaching for Mastery Specialist
- ▶ NCETM Professional Development Lead Teacher
- ▶ NCETM Sussex Maths Hub Lead Teacher
- ▶ Maths Lead for 15 years
- ▶ DfE / STA consultant (maths)

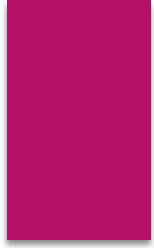


Our journey begins...





Shoreham Beach
Primary School



Celebrating ten years of the Maths Hubs Programme!

Discover how Maths Hubs are supporting teachers to transform maths education across England and discover how you can get involved today

The old days...



The old days...

RULES



PROCEDURES



For example, number bonds

- ▶ Procedural:
 - ▶ Learn your number bonds!
- ▶ Assumption that these can be learnt by rote



Now...

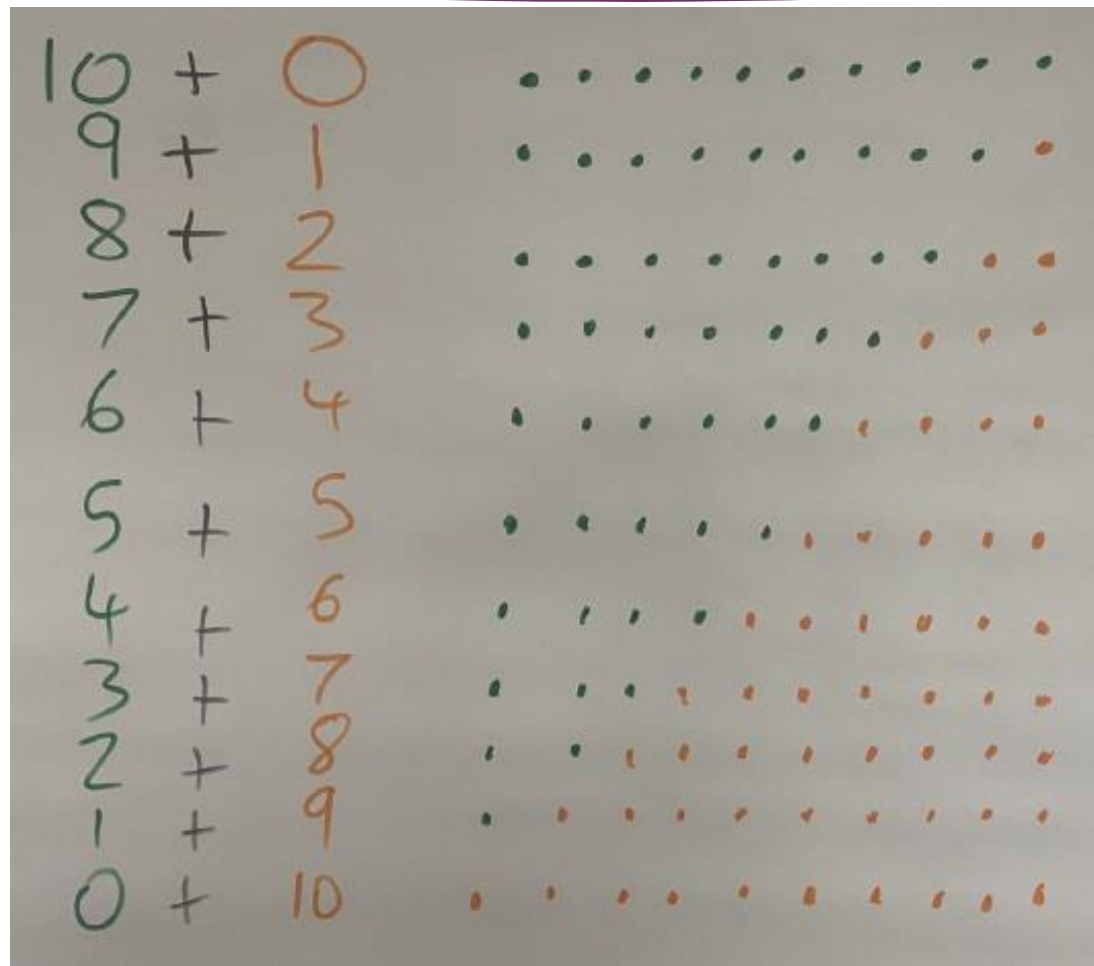


CONCEPTS!



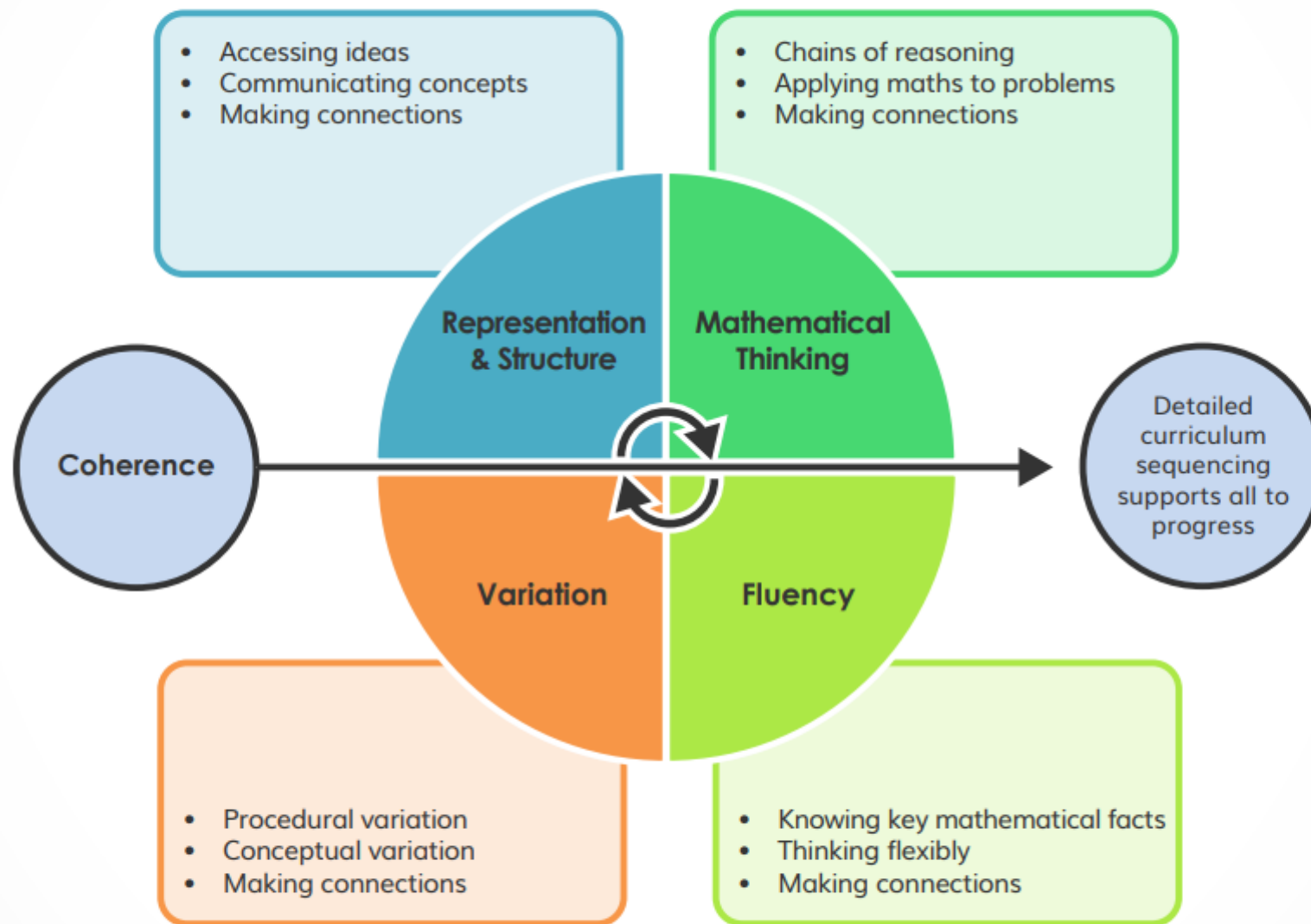
Shoreham Beach
Primary School

For example, number bonds



Teaching for Mastery

Five Big Ideas



Language



*How can we talk about maths
if we can't define key words?*



Language

- ▶ digit
- ▶ number
- ▶ multiplication
- ▶ numerator
- ▶ denominator
- ▶ square number



Language

- ▶ digit – the digits are 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. They are the mathematical alphabet and we use them to make numbers.
- ▶ number – numbers are made of digits. They show how much or how many.
- ▶ multiplication – counting in equal groups.
- ▶ denominator – the number of equal parts the whole is split into.
- ▶ numerator – the number of equal parts of the whole selected.
- ▶ square number – a number that can be arranged into the shape of a square.



235×10 – procedural?

- ▶ ...add a zero
- ▶ ...put a zero on the end



235×10 – *conceptual*

- ▶ Multiplying by 10 makes the value of each digit ten times bigger.
- ▶ This means the digit moves one place value column to the left.
- ▶ We then put a placeholder zero in the Ones column.



Gattegno chart – reveals structure and relationships

1,000,000	2,000,000	3,000,000	4,000,000	5,000,000	6,000,000	7,000,000	8,000,000	9,000,000
100,000	200,000	300,000	400,000	500,000	600,000	700,000	800,000	900,000
10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000	90,000
1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09



23.5×10 – procedural?

- ▶ ...add a zero
- ▶ ...put a zero on the end



Some structures to show concepts visually include:

- ▶ fives frame
- ▶ tens frame
- ▶ number line
- ▶ bar model
- ▶ part whole model
- ▶ factor product model
- ▶ place value



Linguistic structure

place value - shows the value of each digit.

Millions Thousands
HTO HTO HTO

The value of the digit —
is ————.



Linguistic structure

Unitisation - if we know one fact, we know many facts by unitising.

For example:

$$3 \text{ ______ } + 2 \text{ ______ } = 5 \text{ ______ }$$

$$8 \text{ ______ } - 7 \text{ ______ } = 1 \text{ ______ }$$



Purposeful repetition

- ▶ Speaking in full, mathematically accurate sentences
 - not just answers
 - value the journey



*Remember we were talking
about the old days..?*

RULES



MYTHS

PROCEDURES



Mythbusting

- ▶ Identifying statements and ideas that either:
 - have no link to concept, or,
 - later turn out not to be true, or,
 - are completely wrong
- ▶ Why do these exist?
 - Procedural knowledge, lack of concepts



Mythbusting

- ▶ Hungry crocodiles



Mythbusting

856



829

3,547



3,582

10,503



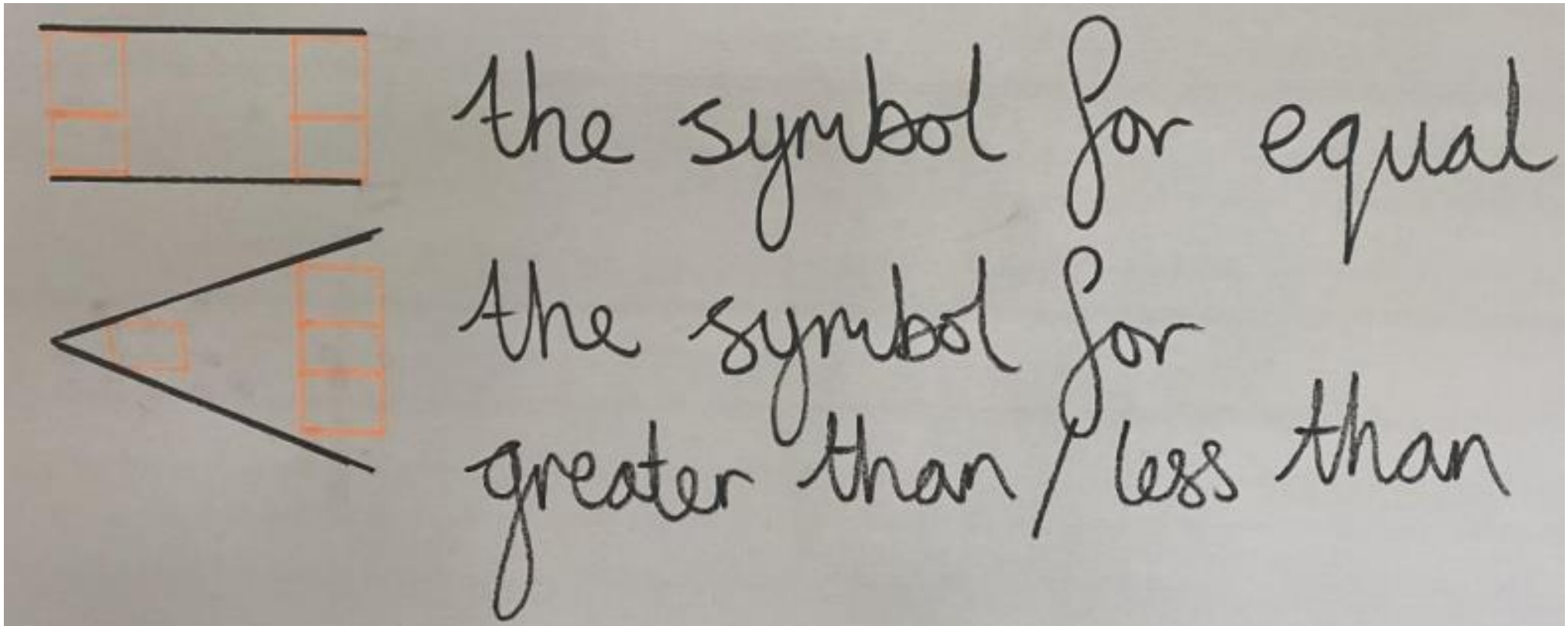
10,503



Mythbusting



The concept



Mythbusting

- ▶ Rounding – ‘if it’s 4 or less you round down, if it’s 5 or more you round up’
 - Sometimes true but it all depends on the context



Mythbusting

- ▶ Column subtraction - 'You must, you can't...'
- ▶ When you multiply 'it gets bigger' and when you divide 'it gets smaller'
- ▶ 'Bus stop method'



Recommended reading

<https://www.ncetm.org.uk/features/maths-mindsets-and-mastery/>

<https://www.ncetm.org.uk/features/multiplying-by-10-is-it-ok-to-just-put-a-zero/>



Be child led



Shoreham Beach
Primary School