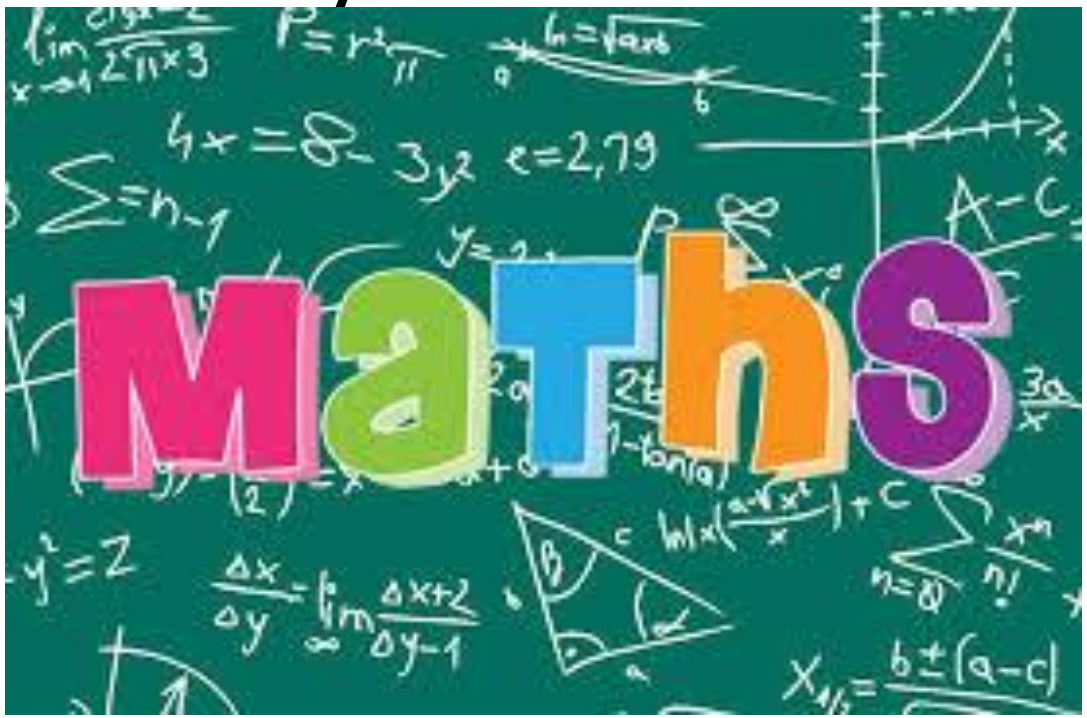
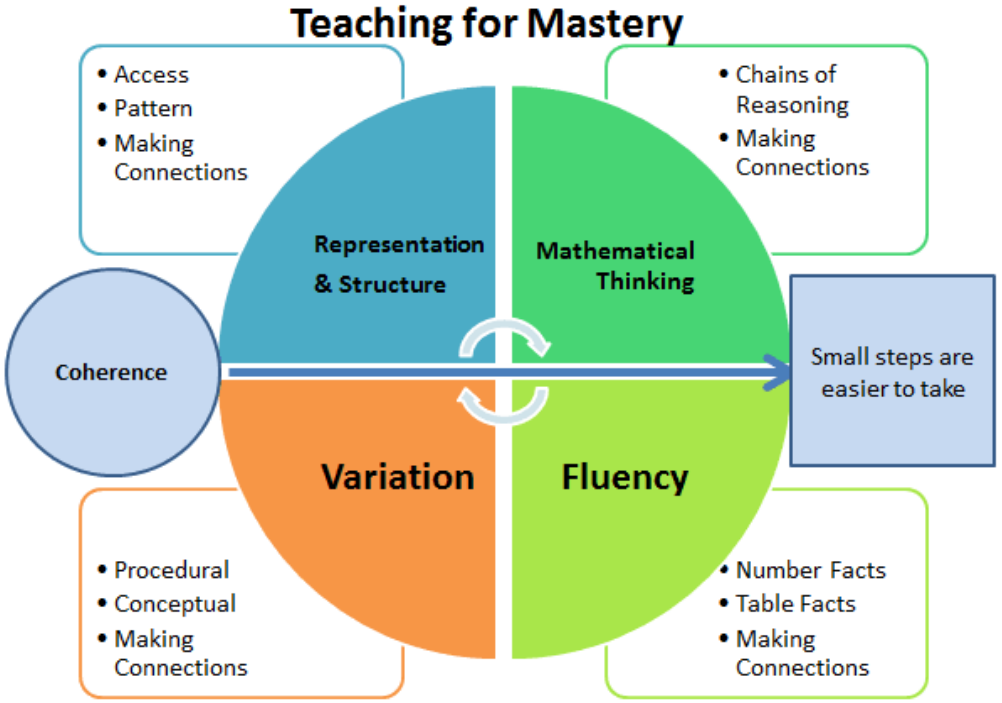
Maths Mastery @ Widmer End Community Combined School



‘Teaching **maths** for **mastery** is a key plank of the Government's education reforms and is reflected in the 2014 English national curriculum for **mathematics**. The NCETM, Department for Education and OFSTED have all endorsed this evidence-based approach which is a key part of the work within the **Maths** Hubs Programme.’

https://mathsnoproblem.com/en/mastery/what-is-maths-mastery



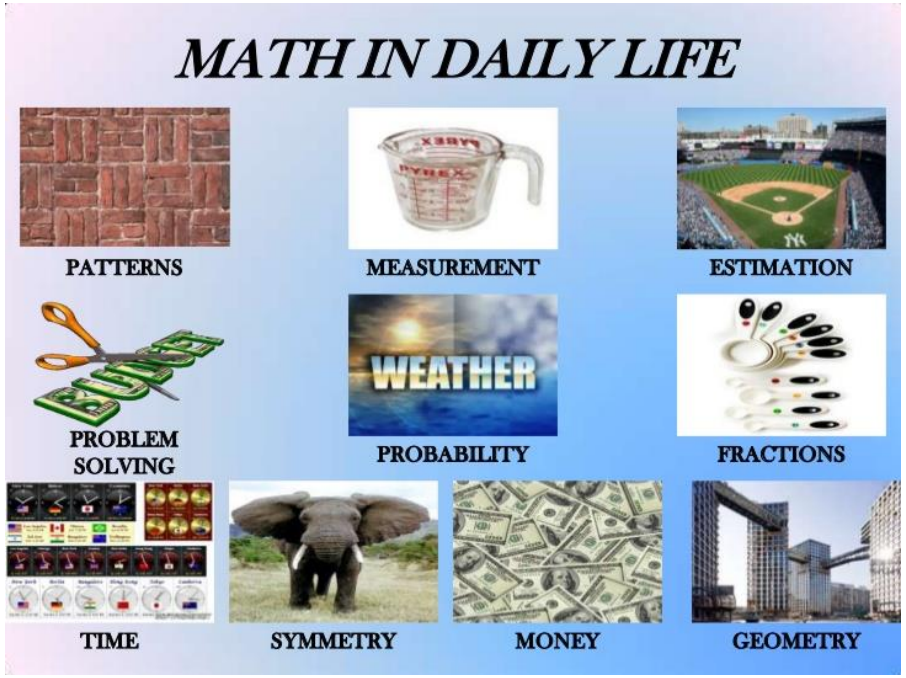
So, what are they doing differently?

Maths
2015 (2012)

www.tes.com

Rank	*Country*	*Score*
1 (2)	Singapore	564 (573)
2 (3)	Hong Kong (China)	548 (561)
3 (6)	Macao (China)	544 (538)
4 (4)	Taiwan	542 (560)
5 (7)	Japan	532 (536)
6 (1 – as Shanghai)	Beijing-Shanghai-Jiangsu-Guangdong (China)	531 (613 – as Shanghai)
7 (5)	South Korea	524 (554)
8 (9)	Switzerland	521 (531)
9 (11)	Estonia	520 (521)
10 (13)	Canada	516 (518)
11 (10)	Netherlands	512 (523)
12 (22)	Denmark	511 (500)
13 (12)	Finland	511 (519)
14 (21)	Slovenia	510 (501)
15 (15)	Belgium	507 (515)
16 (16)	Germany	506 (514)
17 (14)	Poland	504 (518)
18 (20)	Republic of Ireland	504 (501)
19 (30)	Norway	502 (489)
20 (18)	Austria	497 (506)
21 (23)	New Zealand	495 (500)
22 (17)	Vietnam	495 (511)
23 (34)	Russia	494 (482)
24 (38)	Sweden	494 (478)
25 (19)	Australia	494 (504)
26 (25)	France	493 (495)
27 (26)	**United Kingdom**	**492 (494)**
28 (24)	Czech Republic	492 (499)
29 (31)	Portugal	492 (487)
30 (32)	Italy	490 (485)

Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.



- **Did that describe the maths education you received?**
- **What are your memories of Maths lessons in primary school?**
- Discuss 3 positive and negative experiences of Maths you had when you were a child.

What about in Secondary?

- **Which words or phrases make maths sound exciting?**

If children hear 'I can't do maths' from parents, teachers, friends they begin to believe it isn't important.
People become less embarrassed about maths skills as it is acceptable to be 'rubbish at maths.'

Speaking and listening

Vocabulary
Questioning
Full sentences with sentence scaffolds
Reasoning and explanation

How do you know?
Can you show me?

Prove it to me…
Can you show me in a different way?

Here, we are using **Power Maths** as a basis of our maths lessons. This is an exciting mastery approach, that works for every child.

It has been recommended by the Department of Education, to ensure that the aims, of the National Curriculum are achieved.

At the heart of Power Maths is the belief that all children can achieve. ***It rejects the idea that people simply 'can't do' maths.***

It is built around hard work, practice and a willingness to see mistakes as learning opportunities.

The Power Maths teaching model:

The curriculum is broken down into core concepts, taught in units e.g. addition and subtraction, multiplication and division, shape, statistics etc.

Each unit is then divided into small learning steps – lessons

Each lesson is sequenced in the same format:

Power Up – Discover – Share – Think Together – Practice – Reflect

POWER UP!

•We begin each maths lesson with a 'Power Up' activity designed to support fluency in all key number facts.

•Power Ups reinforce key things that are essential for success:

•times tables, patterns in number, number bonds etc.

Power Up

What numbers go in the shaded boxes?

38	39	40			43
23	22	21	20		
		44	45		

Create a missing number track for your partner.

Discover

- The 'Discover' part of the lesson kicks off the core concept being taught in the lesson.
- It is a practical real-life problem that the children work in pairs to try to solve.
- It is encouraged that children use concrete objects during this part of the lesson and gives them time to play, explore and discuss possible strategies.

Discover

1 a) How many butterflies are there in the tray?

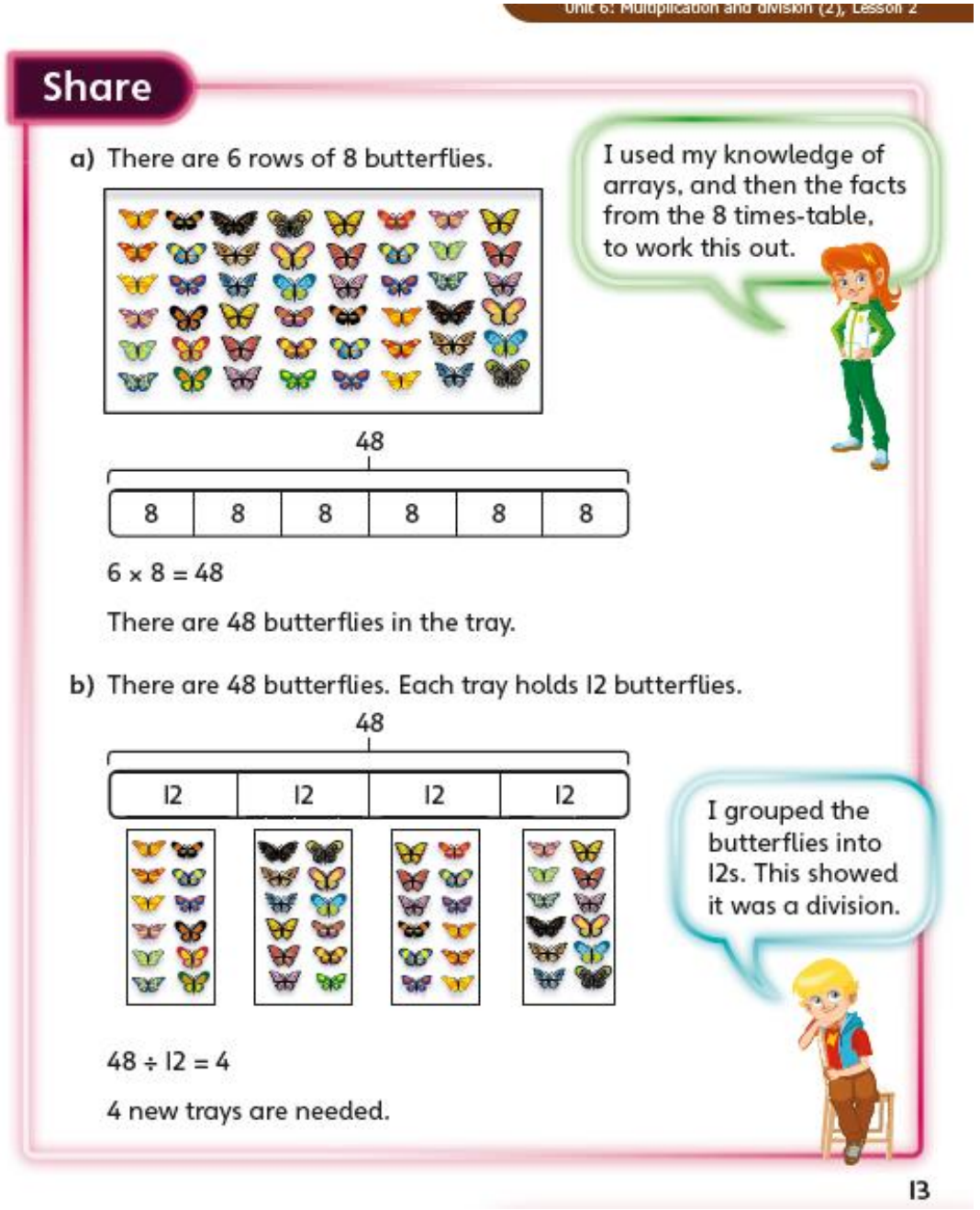
b) The butterflies are put into new trays.

Each tray holds 12 butterflies.

How many new trays are needed?

Share

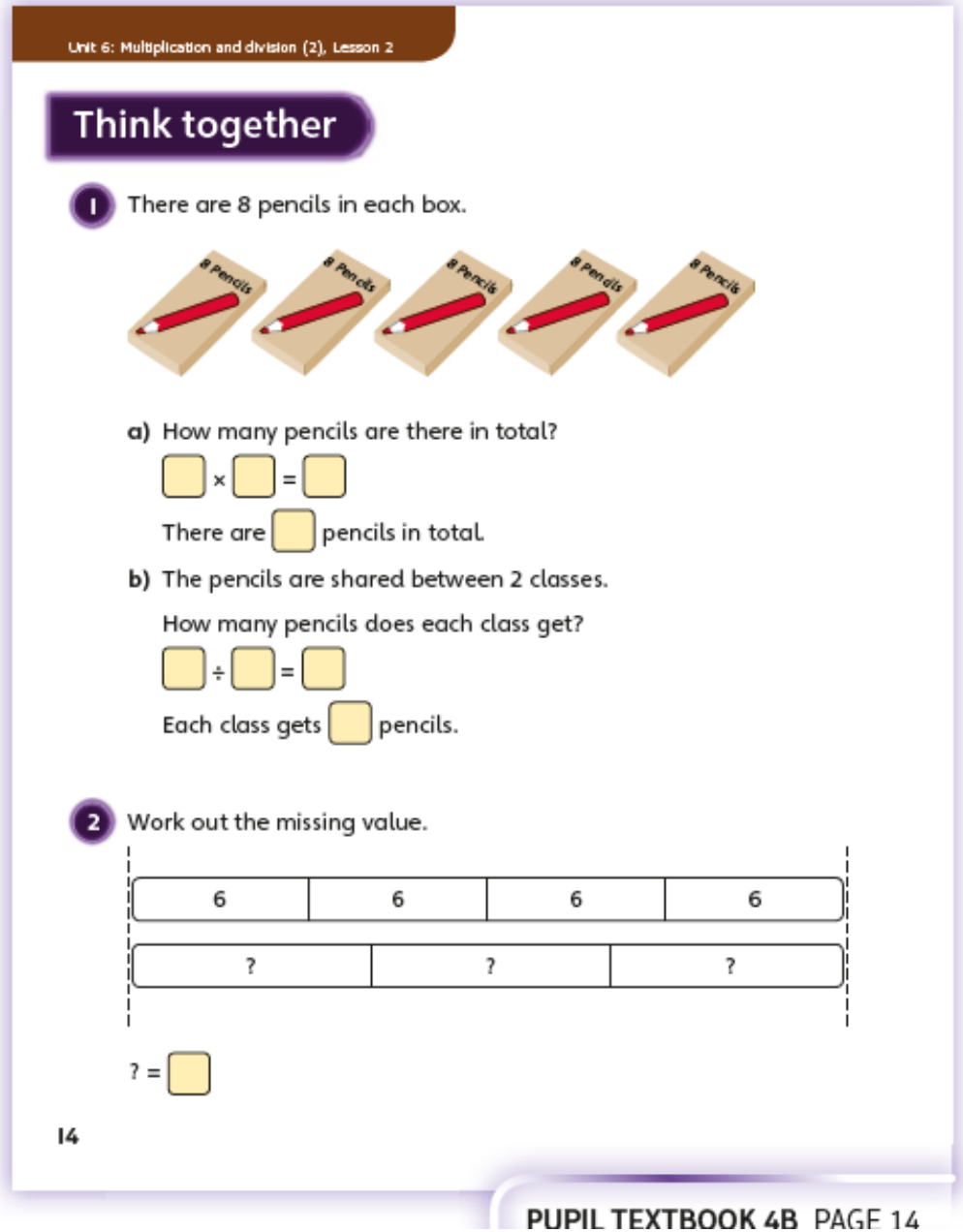
- The 'Share' section allows the children to share and celebrate their solutions and strategies that they used to solve the problem from the 'Discover' section.
- This shows how the concrete apparatus that the children used to explore the math concept, can then be explored using pictures.
- 'Share' is the "seeing" stage. It encourages the children to make a mental connection between the physical object they just handled and the abstract pictures, diagrams or models that represent the objects from the problem.



Think Together

This section of the lesson allows children to explore new problems using the mathematical strategies they have learnt from the 'Share' section.

The questions promote child independence and an 'I can' attitude by following an **'I do, We do, You do approach'.**



Unit 6: Multiplication and division (2), Lesson 2

Think together

1 There are 8 pencils in each box.

a) How many pencils are there in total?

□ × □ = □

There are □ pencils in total.

b) The pencils are shared between 2 classes.

How many pencils does each class get?

□ ÷ □ = □

Each class gets □ pencils.

2 Work out the missing value.

6	6	6	6
?	?	?	

? = □

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PUPIL TEXTBOOK 4B PAGE 14

Practice

The children have their own practice book and they work independently, following the same learning that has been explored through the 'Discover', 'Share', 'Think Together' sections.

The questions in the practice book follow small steps of progression in order to deepen their learning.

Reflect

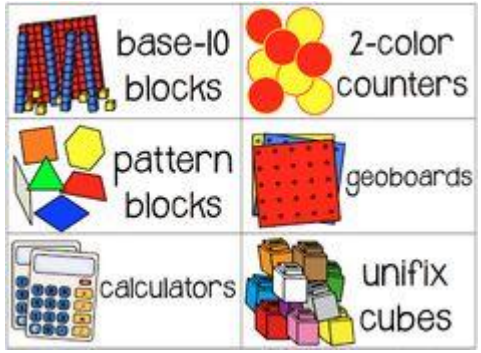
This section allows us the opportunity to check children's understanding and how deeply the children have understood the maths concept being taught.

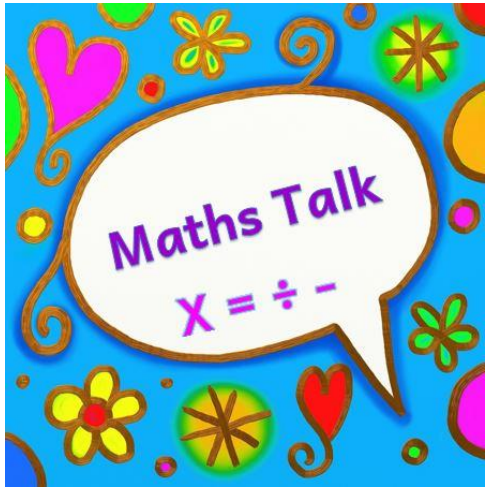
An approach based on mastery principles:

- makes use of mathematical representations that expose the underlying structure of the mathematics;
- helps children to make sense of concepts and achieve fluency which develops **conceptual understanding** and procedural **fluency** in parallel;
- **blends whole class discussion** and **precise questioning** with intelligent practice and, **where necessary, individual support**.

So how do we encourage the children to be more resilient and self sufficient?

- Use your RUCSAC
- Use of manipulatives
- Maths Talk





- Stem sentences- choral recitation- **Sentence Stems**. This technique gives students the opportunity to respond in the form of a complete **sentence** to effectively communicate. **Sentence stems** provide scaffolding to help students get started in speaking or writing without the added pressure of thinking about how to correctly formulate a response.
- Writing reflective sentences on their work daily

Everyone Can Succeed

As a school, we believe that **all** students can succeed in mathematics. We don't believe that there are individuals who can do maths and those that cannot. A **positive** parent, pupil and teacher **growth mindset** coupled with strong subject knowledge are key to student success in mathematics.

POWER MATHS characters use growth mindset approaches