

# Maths mastery in KS2

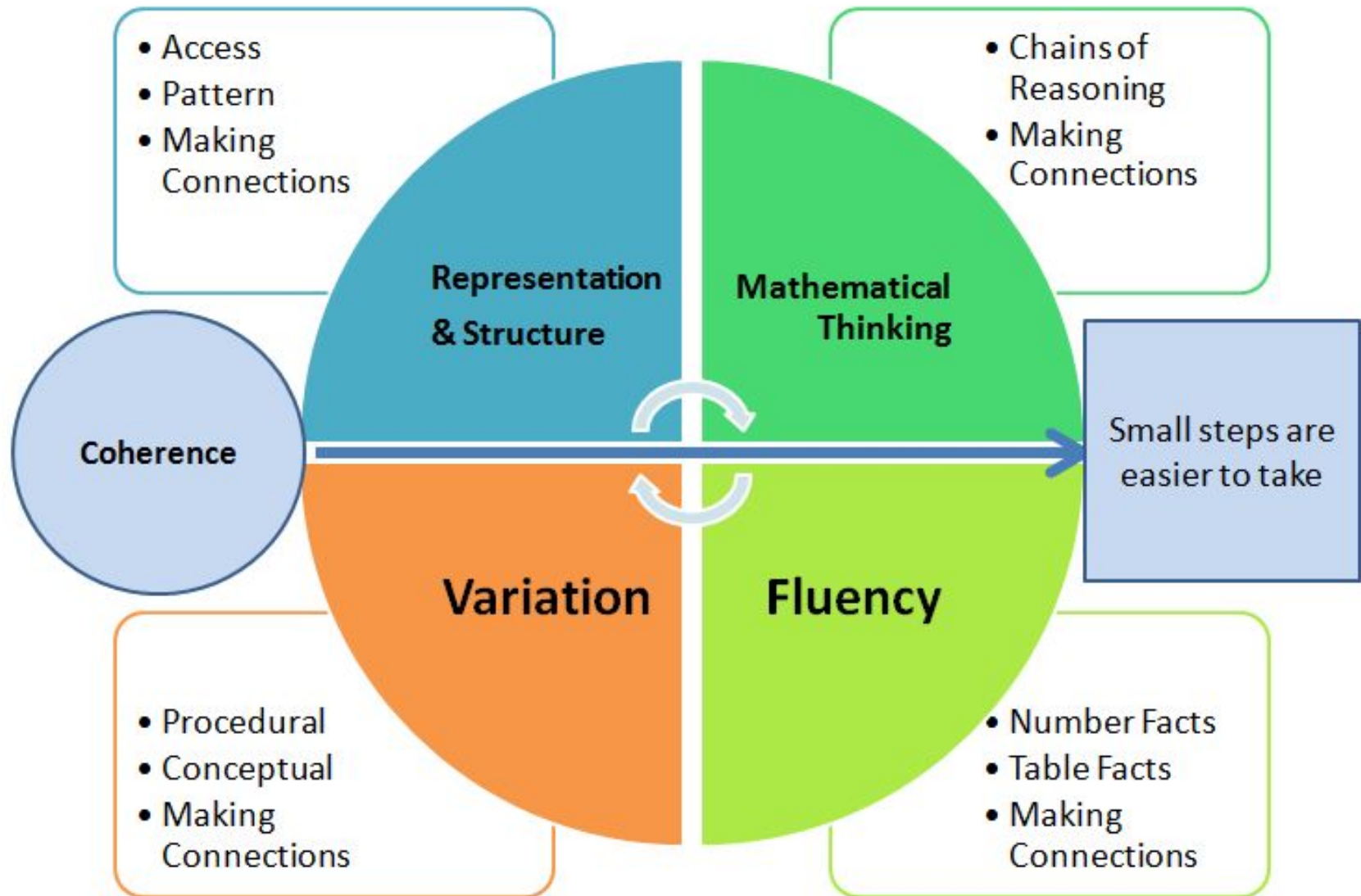
*Wednesday 21st January 2026*

- Mastering maths means pupils acquiring a deep, long-term, secure and adaptable understanding of the subject.
- The phrase ‘teaching for mastery’ describes the elements of classroom practice and school organisation that combine to give pupils the best chances of mastering maths.
- Achieving mastery means acquiring a solid enough understanding of the maths that’s been taught to enable pupils to move on to more advanced material.

# Our aim

- To explore the 5 key areas for teaching for mastery
- To equip you with some skills to help support your child in their understanding of Maths.

# How do we teach for mastery?



# How do we teach for mastery?

## Representation and structure

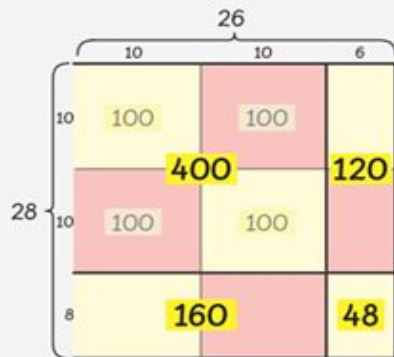
Representation and structure is used to expose the mathematical structure being taught with the aim being that children will be able to move on to doing the maths without recourse to the representation.

This can be concrete or pictorial representation and should not be limited to KS1 only.

How can we help?

Use household objects and encourage children to draw representations.

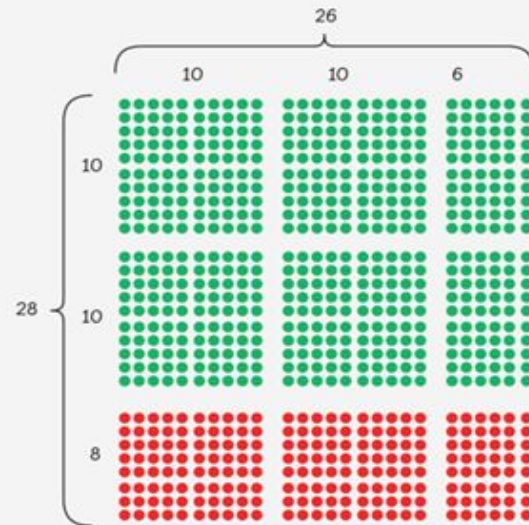
There are 28 rows.  
Each row consists of 26 seats.



$28 \times 26$   
 $= 400 + 160 + 120 + 48$   
 $= 728$



There are 728 seats.



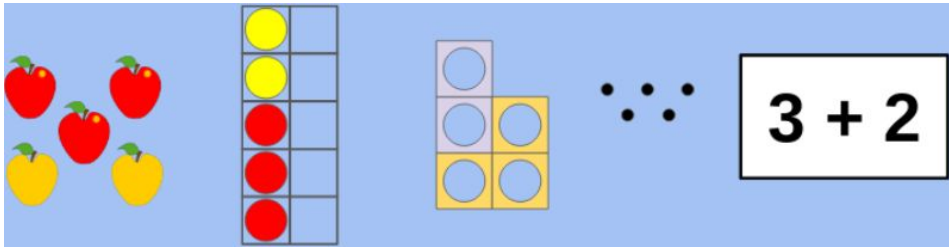
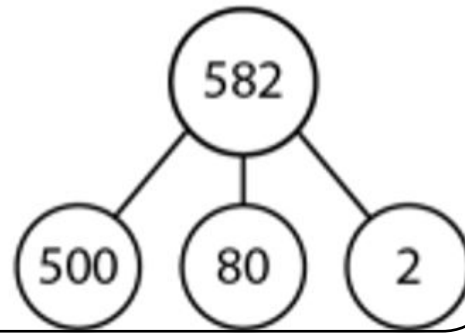
# How do we teach for mastery?

## Representation and structure

Numerical and linguistic representations- stem sentences and correct vocabulary

Using the correct resources

There are \_\_\_\_\_ hundreds.  
There are \_\_\_\_\_ tens.  
There are \_\_\_\_\_ ones.  
Altogether, there are \_\_\_\_\_.



There are \_\_\_\_\_ hundreds, \_\_\_\_\_ tens and \_\_\_\_\_ ones. The number is \_\_\_\_\_

\_\_\_\_\_ = \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_

The difference in value between the start and end point is 1,000,000  
There are 10 intervals.  $1,000,000 \div 10 = 100,000$   
The number line is counting up in 100,000s

# How do we teach for mastery?

## Fluency

Fluency is more than just rapid recall of number facts. It also encompasses efficiency, accuracy and flexibility.

Fluency demands the flexibility to move between different contexts and representations of mathematics, to recognise relationships and make connections and to make appropriate choices from a whole toolkit of methods, strategies and approaches.

How can we help?


Discuss different methods with children. Explore relationships between numbers.

Y3 Place Value 7

Place Value: Hundreds

**Fluency**

1) There are 100 fidget spinners in each box. How many fidget spinners are there altogether?



2) Complete the sequences:

200	300		500	
-----	-----	--	-----	--

	900		700	
--	-----	--	-----	--

3) Use  $<$  or  $>$  or  $=$  to compare the place value charts:

Hundreds	Tens	Ones		Hundreds	Tens	Ones
●			○	●		
●				●		
				●		

# How do we teach for mastery?

a)  $400 + 300$

$430 + 300$

$439 + 300$

$300 + 477$

b)  $700 - 200$

$780 - 200$

$783 - 200$

$701 - 200$

What do these mean?  
Automaticity  
Subitising

Write down what patterns you notice.

$999 \times 8$

$999$	$1000 \times 8 - 8$
$\times 8$	$8000 - 8$
$\hline 7992$	$7992$
$\begin{array}{r} 7 \\ 7 \end{array}$	

Which method demonstrates fluency?

# How do we teach for mastery?

## Variation

Variation highlights the essential features of a concept or idea by varying the non-essential features.

To emphasise variation, it is important to show children - What the mathematical concept is  
- What the mathematical concept is not

When constructing a set of activities/questions, it is important to consider what connects the examples; what mathematical structures are being highlighted?

### Procedural variation

Progression through a variety of problems/calculations to form an understanding of a concept, stage by stage

$$\begin{array}{l} 18 - \square = 8 \\ 18 - \square = 10 \\ 18 - \square = 12 \\ 18 - \square = 14 \\ 18 - \square = 16 \end{array}$$

$$\begin{array}{l} 2 + 3 = \square \\ \square - 3 = \square \\ 3 + 5 = \square \\ \square - 5 = \square \end{array}$$

$$\begin{array}{l} 180 + 2 = \\ 180 \div 20 = \\ 270 + 30 = \\ 270 \div 90 = \end{array}$$

### Conceptual variation

Experiencing a concept in lots of different contexts

Commutative Property:  $5 \times 3 = 15$

Repeated Addition:  $3 + 3 + 3 + 3 + 3 = 15$

Groups of:  $3 \times 5 = 15$

An Array

3 groups of 5

The image shows a collection of colorful beads arranged in a 3x5 grid, illustrating the concept of multiplication through different contexts: commutative property, repeated addition, groups of, and an array.

# How do we teach for mastery?

## procedural variation

$7 \times 4$   
 $70 \times 4$   
 $70 \times 8$   
 $14 \times 4$   
 $140 \times 40$

If I know this.....

Then I know  
this.....

# How do we teach for mastery?

## Mathematical Reasoning

For children to understand a taught concept deeply, they must be able to *work on* that taught concept. This will look like a child thinking about, reasoning with and discussing that concept with others.

How can we help?

- Ask questions that require children to reason, “What is the same? What is different? What patterns can you see?”
- Ask children to explain, convince/prove, draw diagrams or use manipulatives to illustrate an idea or strategy.

### Explore

A and B are whole numbers.

Rounded to the nearest 100, A is 500

Rounded to the nearest 10, B is 350

**What is the smallest possible difference between A and B?**

# How do we teach for mastery?

Is this sometimes, always or never true?

How is this the same? How is it different?

Can you prove this?

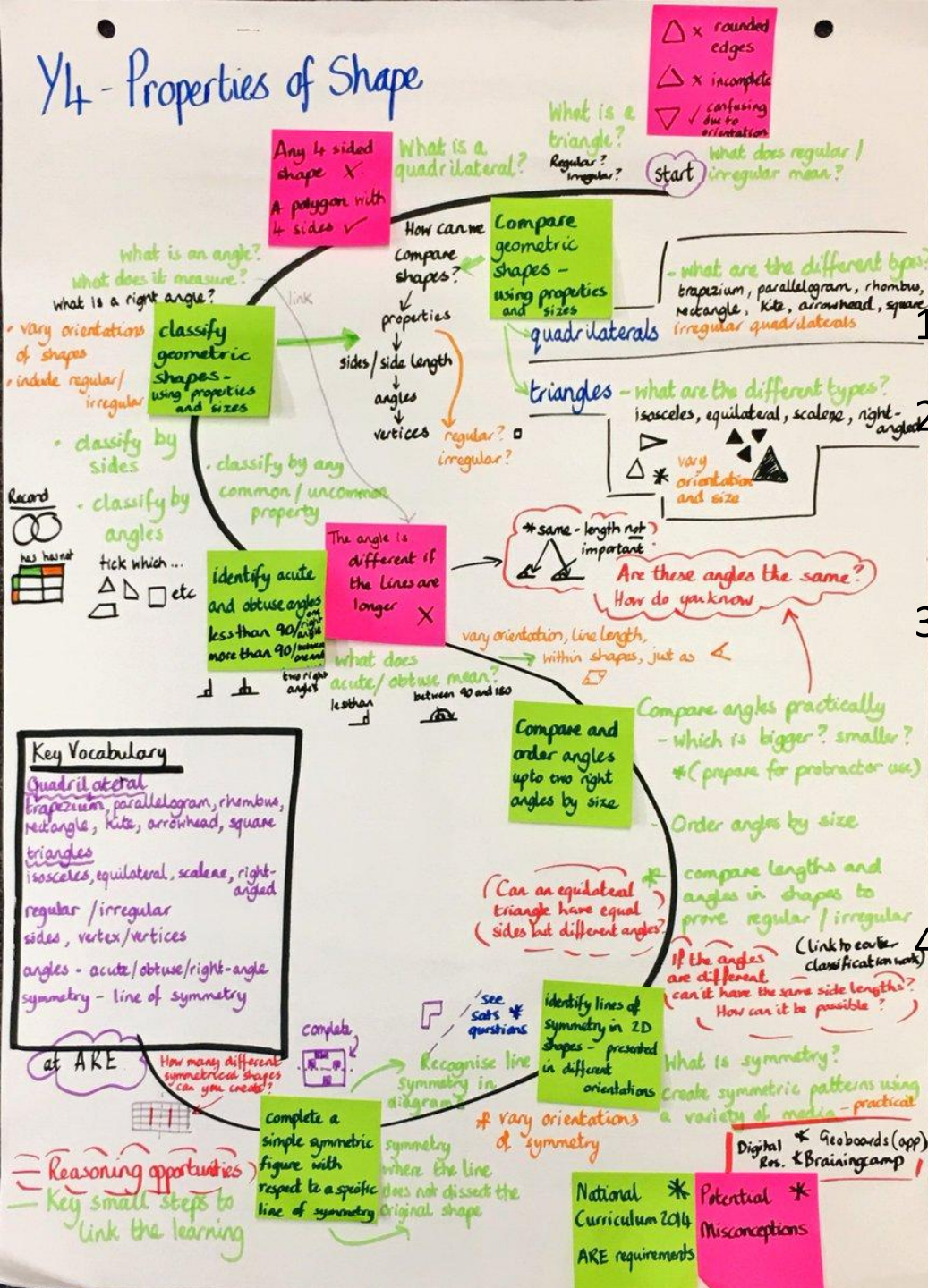
- A** Answer
- B** Because
- C** Convince

	H	T	O
	100 100	10 10	1 1
	100	10 10	1 1
			1 1
			1 1
+			1 1
			1 1

Draw this place value grid in your book and explain what you need to do to complete the calculation.

What column will definitely change, maybe change and never change?

# Y4 - Properties of Shape



# Coherence

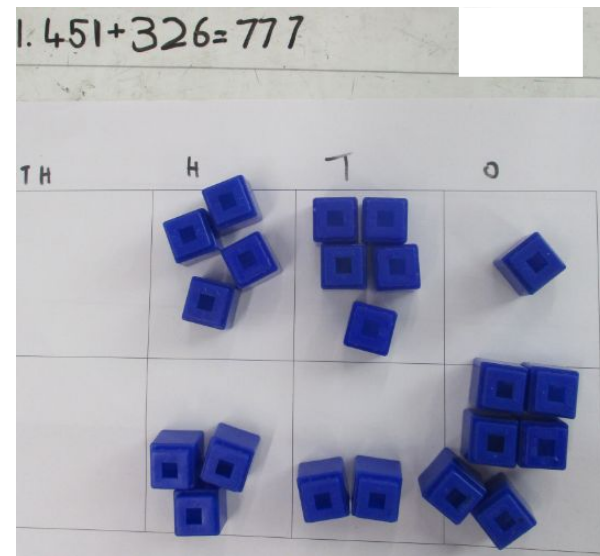
1. Small steps are easier to take.
2. Focusing on one key point, each lesson allows for deep and sustainable learning.
3. Certain images, techniques and concepts are important pre-cursors to later ideas. Getting the sequencing of these right is an important skill in planning and teaching for mastery.
4. When something has been deeply understood and mastered, it can and should be used in the next steps of learning.

# Addition - Vocabulary

$$43 + 7 = 50$$

Diagram illustrating the components of an addition equation:

- An orange arrow points from the number 43 to the word **Addend**.
- A black arrow points from the number 7 to the word **Addend**.
- A purple arrow points from the number 50 to the word **Sum**.



Why do we need to use these words?

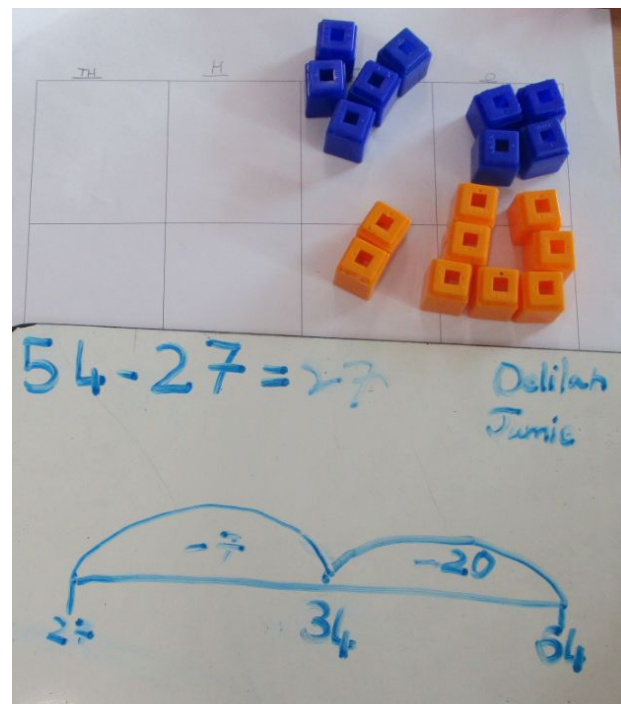
# Subtraction - Vocabulary

$$43 - 7 = 36$$

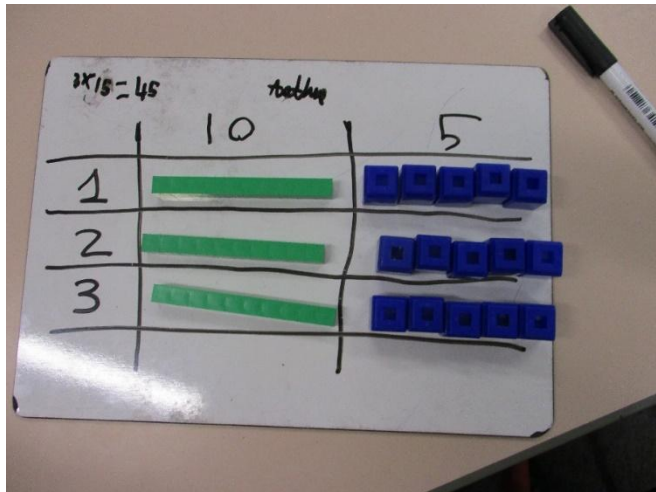
Minuend

Subtrahend

Difference



# Multiplication - Vocabulary



$$43 \times 7 = 301$$

Multiplicand  
(Factor)

Multiplier  
(Factor)

Product

## 3 Laws

Commutative Law

Distributive Law

Associative law

# Division - Vocabulary

$$42 \div 7 = 6$$

↙ Dividend  
↓ Divisor  
↘ Quotient



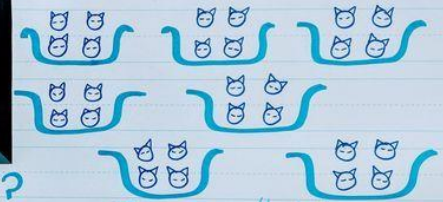
## DIVISION

to separate into equal groups

### SHARING division

UNKNOWN: How many in each group?

There are 28 kittens napping in 7 cat beds at the Animal Rescue Center. There are the same number of kittens in each bed. How many kittens are in each bed?



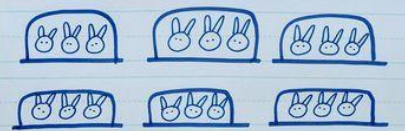
$$\frac{28}{\text{total}} \div \frac{7}{\# \text{ groups}} = \frac{?}{\# \text{ in each group}}$$

There are 4 kittens in each bed.

### GROUPING division

UNKNOWN: How many groups?

There are 18 bunnies at the Animal Rescue Center. Three bunnies can fit in a cage. How many cages do they need to fit all the bunnies?



$$\frac{18}{\text{total}} \div \frac{3}{\# \text{ in each group}} = \frac{?}{\# \text{ groups}}$$

They all need 6 cages to fit the bunnies.

# Greater depth

- Archie and Sophie are both working out the answer to the following question:

$$350 + 278 + 250$$

They have both used different strategies.

Archie's method

$$350 + 278 + 250$$

$$350 + 278 = 628$$

$$628 + 250 = 878$$

Answer = 878

Sophie's method

$$350 + 278 + 250$$

$$350 + 250 = 600$$

$$600 + 278 = 878$$

Answer = 878

Which do you prefer? Explain why.  
Use the method you preferred to solve  
 $320 + 458 + 180$

The sea level is usually taken as zero.

Look at the picture of the lighthouse.

If the red fish is at  $-5$  m (5 metres below sea level):

Where is the yellow fish?

Where is the green fish?



Can you draw a fish at  $-35$  m?

Can you draw a seagull at 20 m above sea level?

What would the position of your fish and the seagull be if each of the intervals on the lighthouse represented 7 m?

# Non-negotiables by end of LKS2


## Multiplication

By the end of Year 4, children should be fluent in their multiplication up to  $12 \times 12$ .

This will provide a strong foundation for them as they move on to UKS2.

# Vocabulary




- Exchange/regroup
- calculation
- number sentence
- oblong 

hundreds tens ones  
H T **1's**

digit  
→  
→  
**62**

number  
**62**



- borrow or steal
- sum = total
- rectangle  
(family name)  

- units

# Useful Links

NCETM National Centre for Excellence in the Teaching of Mathematics

<https://www.ncetm.org.uk/>

Nrich

<http://nrich.maths.org/frontpage>

I See Reasoning

<https://www.iseemaths.com/i-see-reasoning-ks1/>