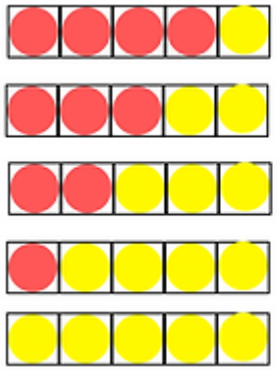
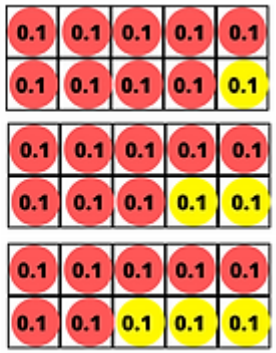
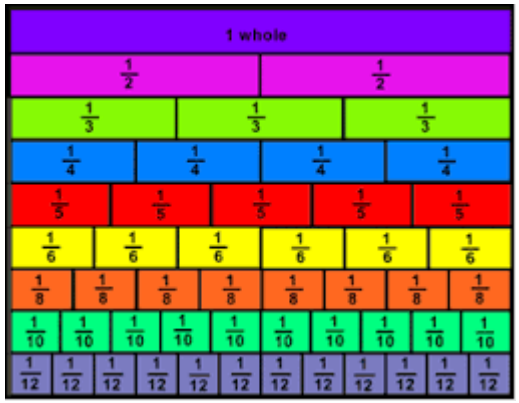
Cecil Road Primary & Nursery School

Together we achieve more

Mathematics workshop





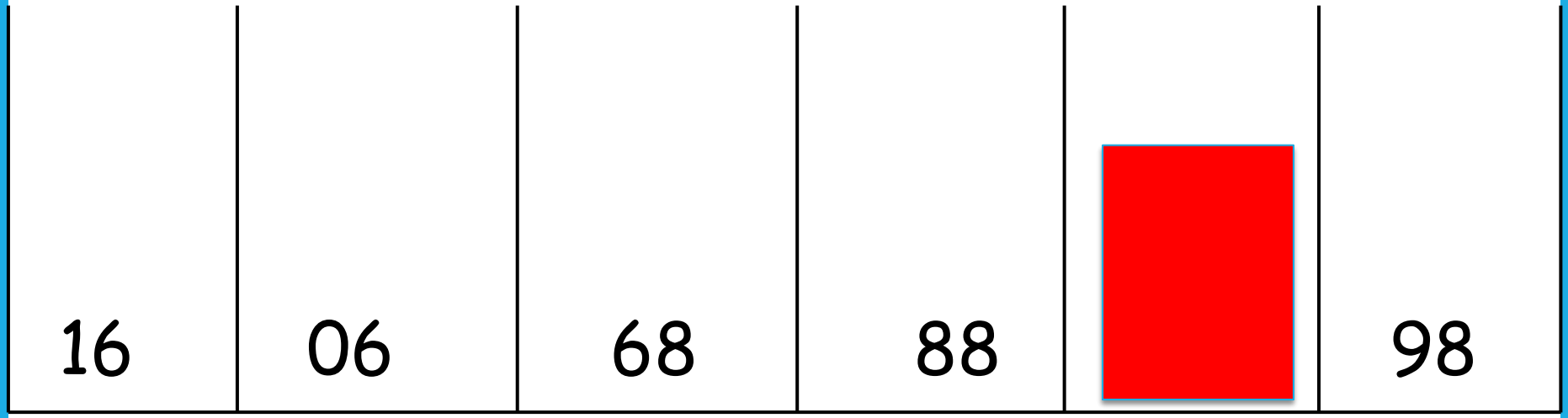


hundreds	tens	ones		tenths	hundredths
			.		
			.		
			.		

100 Square

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

In what number parking spot is the red car parked?

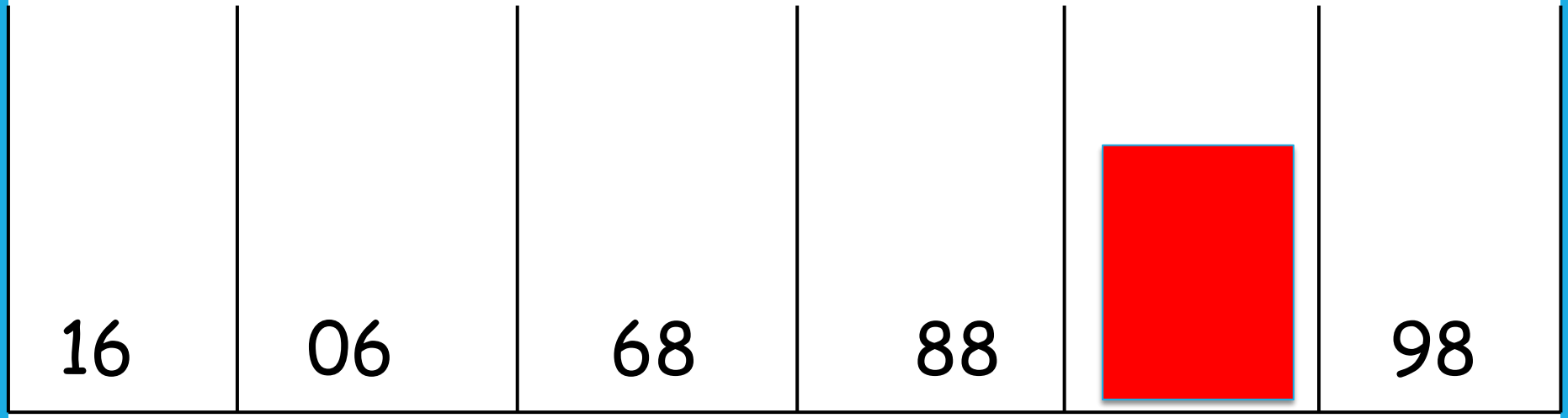


We want our children to become thinkers and collaborators.

In what number parking spot is the red car parked?

ANSWER: 87

(The number line is upside-down)



We want our children to become thinkers and collaborators.

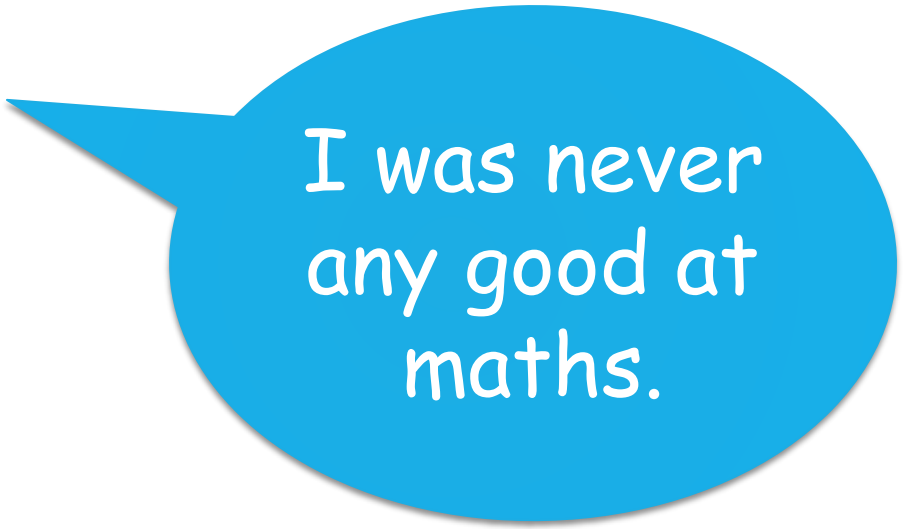
Aims for the workshop today

- What does maths look like in Year 2 and Year 3?
- How is maths taught at Cecil Road Primary School?
- How can children be supported at home?

ON A SCALE OF ONE TO TEN, HOW MUCH DO YOU HONESTLY ENJOY MATHEMATICS?

Research suggests that as many as 60% of adults would rather clean the toilet than work out a maths problem.

An even larger percentage say:



Research also suggests that adults would not openly admit to being poor at reading.

- It may come as a surprise that almost half of the working-age population (17 million) of England have numeracy skills equivalent to those expected for an 11 year-old child.

- Adults with poor numeracy skills are twice as likely to be unemployed than those who enjoy some competency in numeracy.

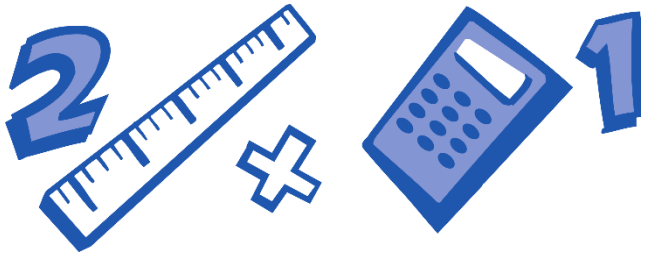
National Curriculum aims for children

- To become *fluent* in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop *conceptual understanding* and the ability to recall and apply knowledge rapidly and accurately
- *To reason* mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by *applying* their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

At Cecil Road we aim for our children:

- To be an active participant in their own learning.
- To be confident and numerate.
- To be ***fluent*** in their mathematics at the appropriate level.
- To be able to ***reason*** about their learning using the correct mathematical vocabulary.
- To be able to *apply* their skills and knowledge as they progress, through ***sustainable*** learning.
- *To develop an appreciation that mathematics is a key skill that equips them for life.*
- To *enjoy* mathematics

What does Maths learning look like at Cecil Road?



Our curriculum is based on the national curriculum and White Rose Maths and other materials that support the delivery of the curriculum.

These include: NCETM, NRich- these are used across KS1 and KS2 allowing children to be exposed to a variety of different types of learning and to ensure coverage of fluency, problem solving and reasoning in different formats to ensure that our maths curriculum is rich and varied.

What does Maths look like in Year 3?

Consistently use the correct number formation (0-9).

To recognise the place value of each digit in a three-digit number (hundreds, tens and ones).

To read and write numbers up to 1,000

To add and subtract mentally and scaling these by 10 e.g. 6 + 3 = 9, 60 + 30 = 90.

To choose strategies to help me answer questions such as partitioning, number lines, counting on, counting back, bar models and eventually formal methods such as the column method.

To identify angles greater than or less than a right angle

To recall my 2, 5, 10s, 3, 4 and 8 times tables and related division facts.

To understand the inverse relationship between add and subtract

To solve number and practical problems, including reasoning using my number knowledge.

3 Use lines and dots to draw each number.

Complete the sentences.

a)

There are 4 tens and 3 ones.

The number is ☐

b)

There are ☐ tens

and ☐ ones.

The number is 50

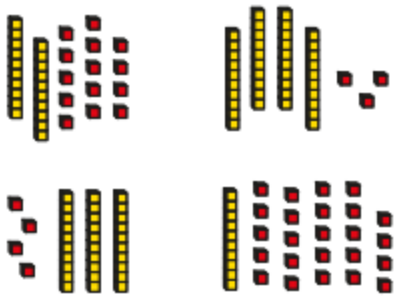
4 Use base 10 to represent the number 47 in two different ways.

Draw your answer.

5 Tiny uses base 10 to make 34 in different ways.

Which picture does **not** represent 34?

Circle your answer.



Talk to a partner about the mistake Tiny has made.

6 Amir is thinking of a 2-digit number.

- There are 3 more tens than ones.
- There are an odd number of ones.

What number could Amir be thinking of?

Find as many numbers as you can.

How many different ways can you show each number?

What does Maths look like in Year 2?

Add and subtract within 100 by applying one-digit addition and subtraction facts. To add and subtract any 2 two-digit numbers.

Practical learning using a variety of resources.

Recognise the place value of each digit in two-digit numbers.

To read the time to the nearest five minutes

To describe the properties of 2D and 3D shapes and compare shapes by their properties

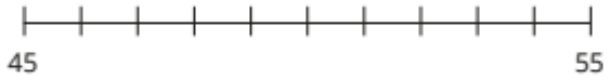
Recognise the subtraction structure of 'difference' and answer questions such as "How many more…?".

Secure fluency in addition and subtraction facts within 10.

4 Draw arrows to show where the numbers belong on the number lines.

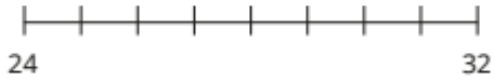
a)

46 49 54



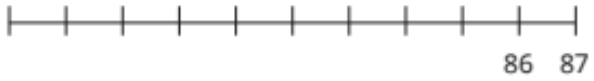
b)

25 30 29

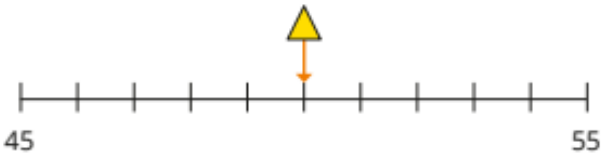


c)

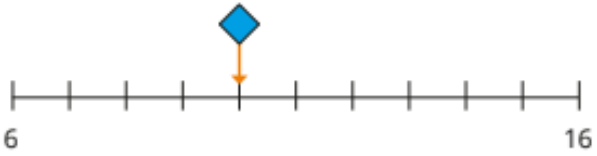
seventy-seven eighty eighty-three



5 **a)** What numbers are the shapes pointing to?



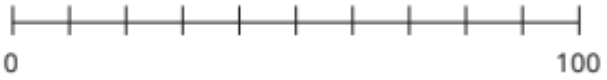
▲ = ☐

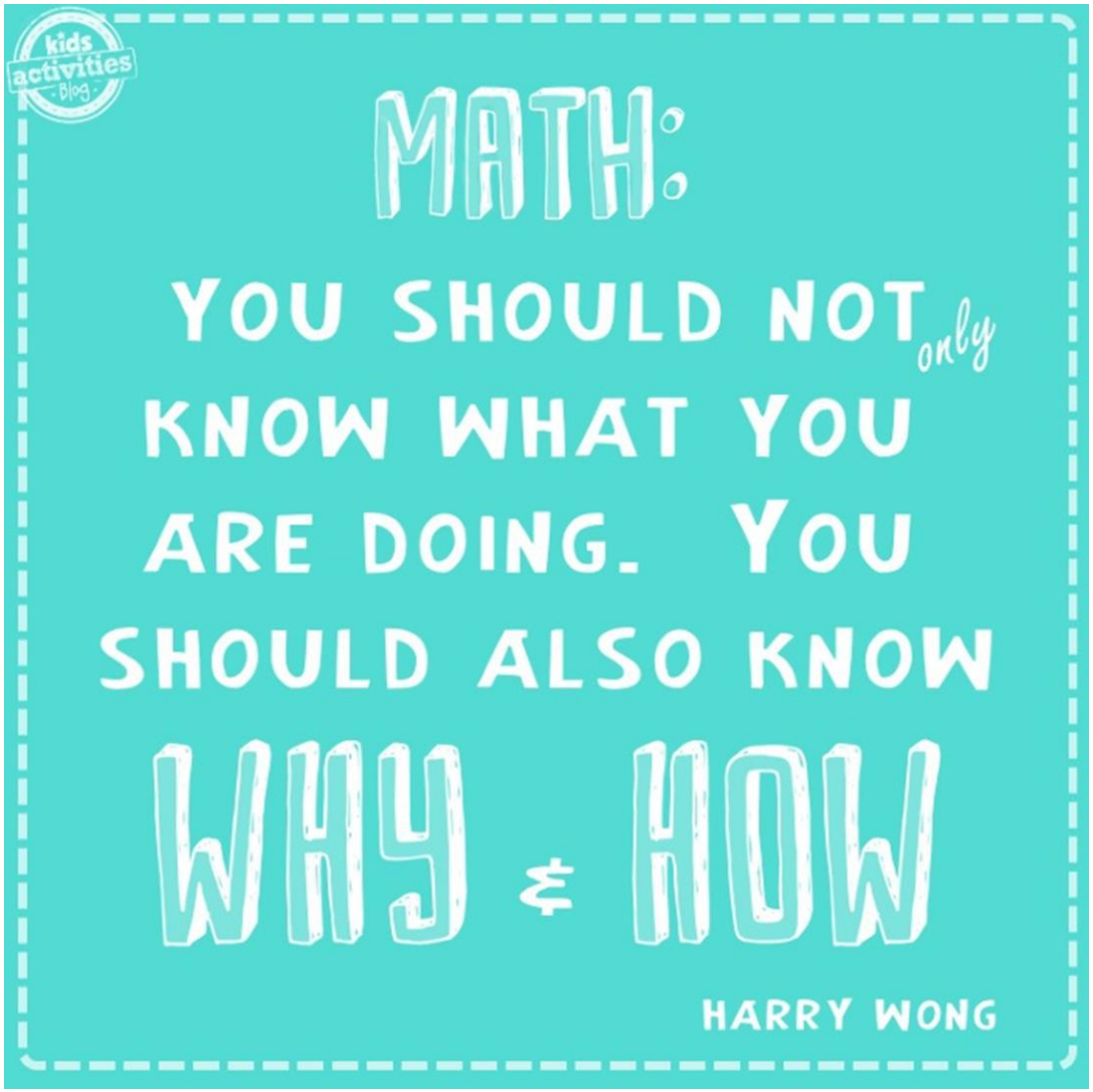


◆ = ☐

b) ▲ + ◆ = ■

Label ■ on the number line.




kids activities Blog
MATH:
YOU SHOULD NOT only KNOW WHAT YOU ARE DOING. YOU SHOULD ALSO KNOW
WHY & HOW
HARRY WONG

The CPA Approach

CONCRETE -
using physical objects
to solve maths problems.

PICTORIAL -
using drawings
to solve maths problems.

ABSTRACT -
solving maths problems
using only numbers.

What is CPA?

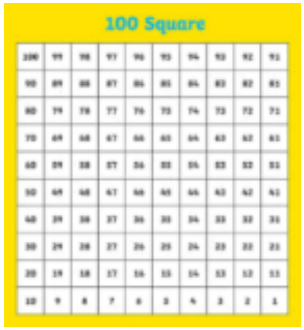
C is for concrete. New concepts are introduced through the use of physical objects or practical equipment. These can be physically handled, enabling children to explore different mathematical concepts. These are sometimes referred to as maths manipulatives and can include ordinary household items such as straws or dice, or specific mathematical resources such as dienes or Numicon.

P is for pictorial. Once children are confident with a concept using concrete resources, they progress to pictorial representations. By doing this, they are no longer manipulating the physical resources, but still benefit from the visual support the resources provides.

A is for abstract. Once children have a secure understanding of the concept through the use of concrete resources and visual images, they are then able to move on to the abstract stage. Here, children are using symbols to solve problems. To be able to access this stage effectively, children need access to the previous two stages alongside it.

Numbers

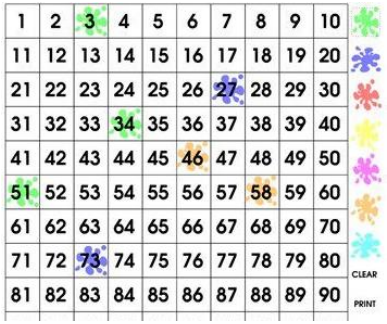
100 Square or you could use 100 square splat online game



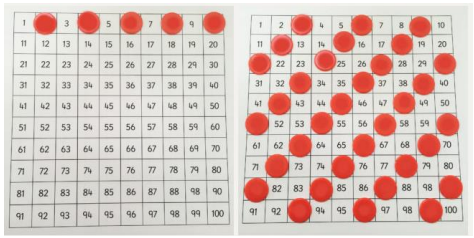
Games you could play:

Cover Up: Cover up one or more squares using counters. The child has to guess which numbers are hidden under the counter/s.

Patterns: Cover the multiples of 2, 3, 5 and 10 etc (one multiple at a time). Use the patterns to predict which numbers will be in the sequence.



Dice or you could use an Online Dice

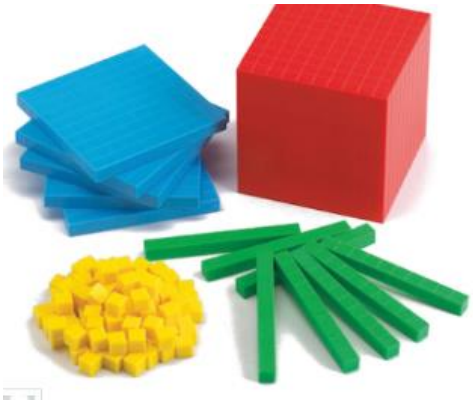


Games you could play:

Use dice to help your child recognise numbers at speed.

Knock Out: Each player chooses a "knock out number" – either 6, 7, 8, or 9. More than one player can choose the same number. Players take turns throwing both dice, once each turn. Add the number of both dice for the score. If a player throws a 6, 7, 8 or 9, they are knocked out of the game until the next round.

Addition/ Subtraction using sweets instead of Base 10



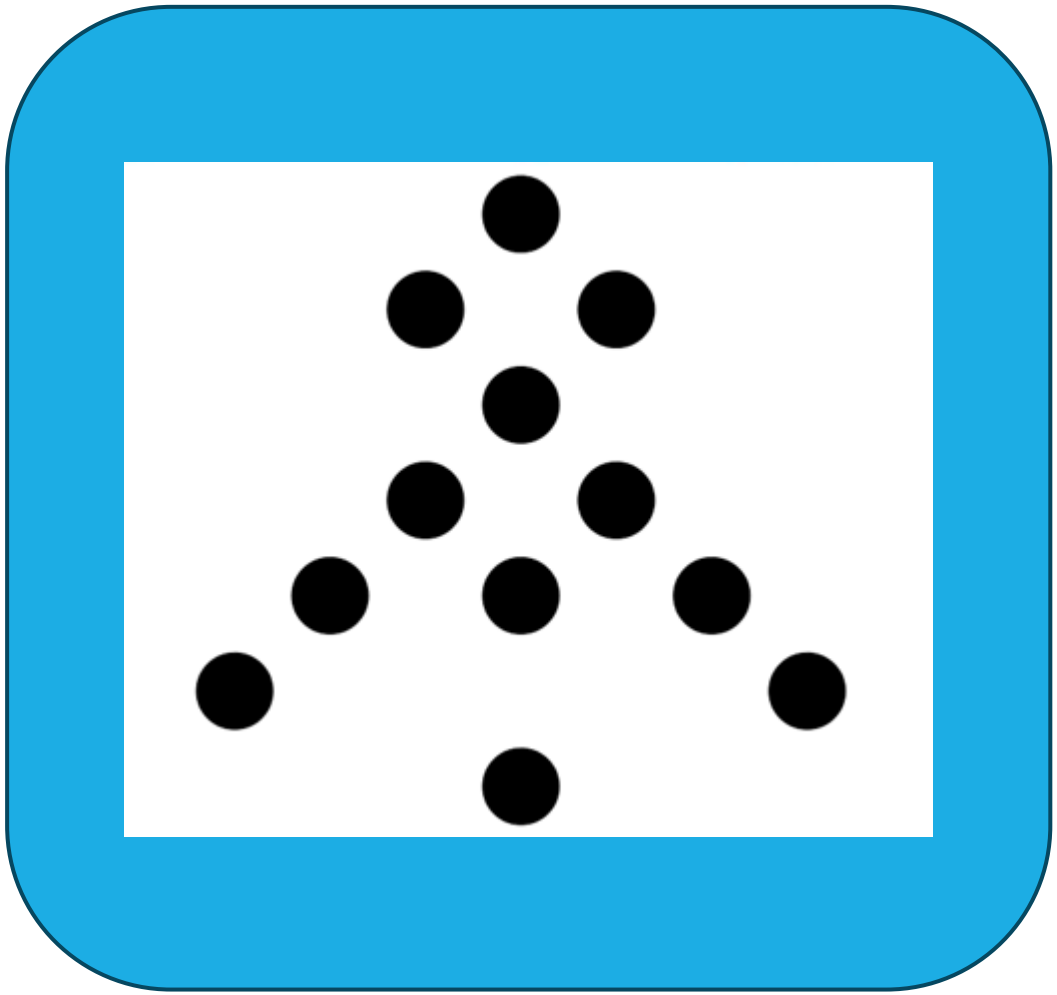
In Year 2 and 3, we use Base 10for addition/ subtraction. Instead of tens and ones resource you could use sweets (such as Chewits). A whole pack of Chewits are the tens and individual Chewits are the ones. E.g. 18 = 1 tens and 8 ones

It is crucial that children can explain their thinking using the appropriate vocabulary. This not only embeds their own learning but supports the learning of others through hearing quality explanation.

Questioning and Talk

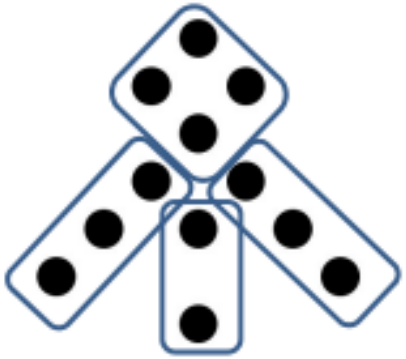
'Teachers can provide regular opportunities for pupils to develop independent metacognition through pupils explaining to themselves, teachers and other pupils how they planned, monitored, and evaluated their completion of a task.'

Working with the person next to you can you write a number sentence to go with the dotted formation?

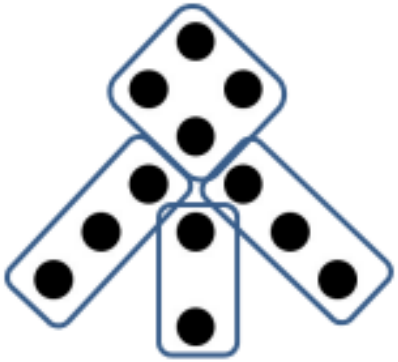


Number Talks

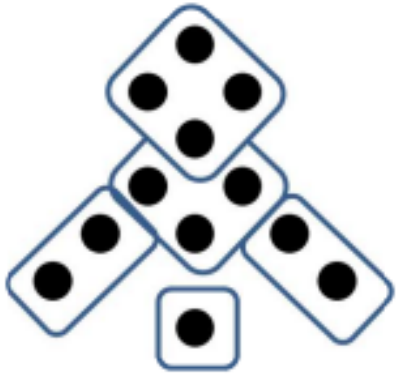
How many ways …?



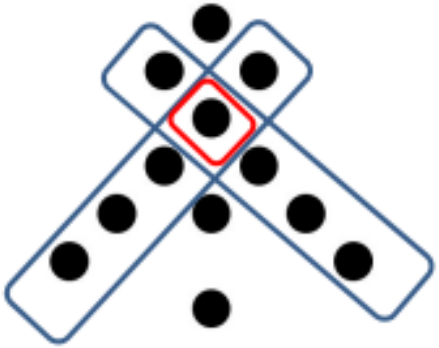
$4 + 3 + 3 + 2 = 12$



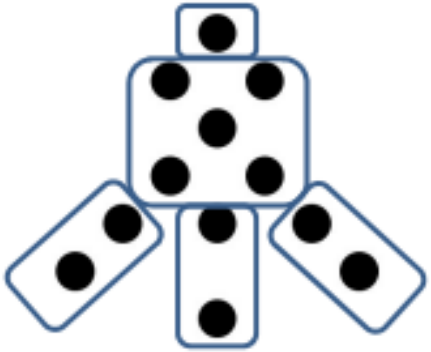
$4 + 3 + 2 + 3 = 12$



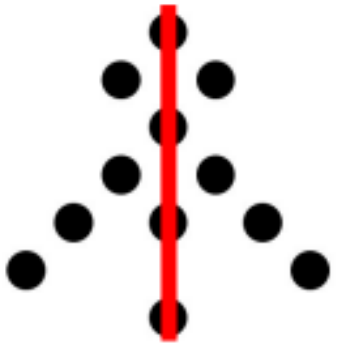
$4 + 3 + 2 + 2 + 1 = 12$



$5 + 5 + 3 - 1 = 12$



$1 + 5 + 2 + 2 + 2 = 12$

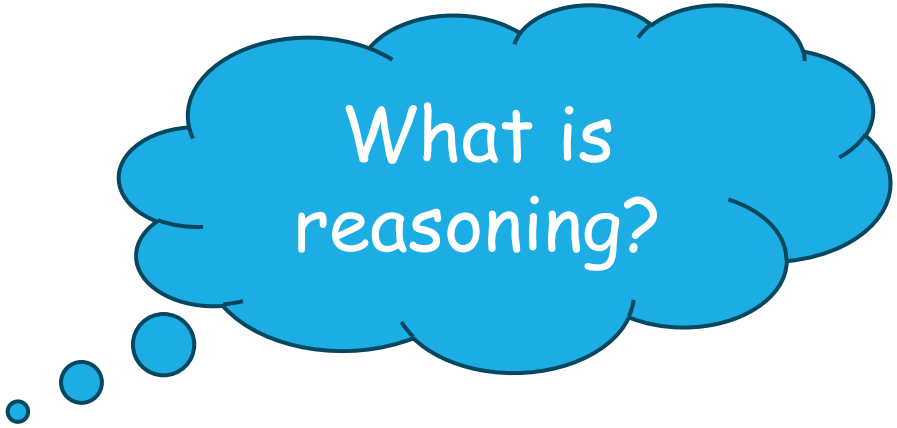


$6 + 6 = 12$

'By giving our students practice in talking with others, we give them frames for thinking on their own.'

Vygotsky, L. (1978)

Reasoning and Problem Solving



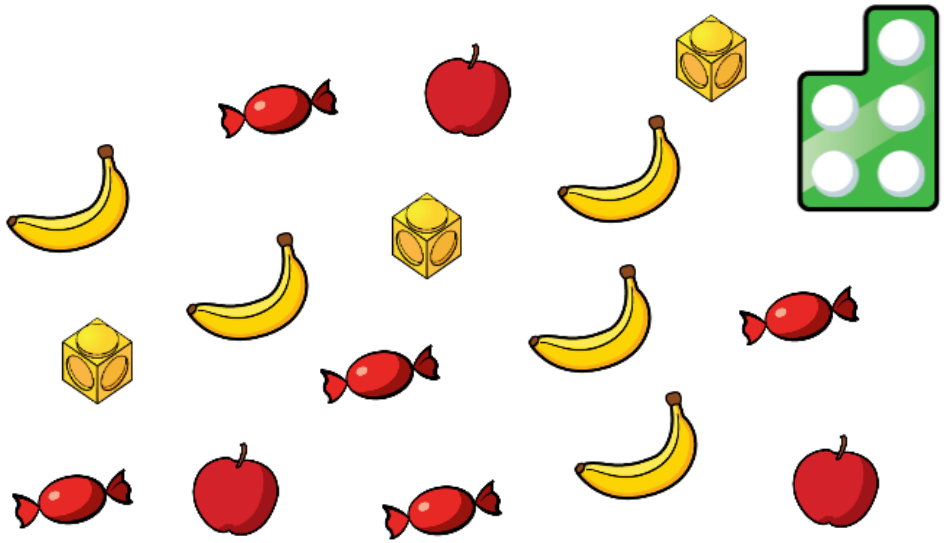
Reasoning is the action of thinking about something in a logical, sensible way.

Progression in Reasoning

Describing	Simply tells what they did
Explaining	Offers some reasons for what they did (may or may not be correct)
Convincing	Confident that their chain for reasoning is right (inductive reasoning)
Justifying	A correct logical argument that has a complete chain of reasoning
Proving	A watertight argument that is mathematically sound (deductive reasoning)

NRICH (2014)

How many different ways can the objects be grouped?



What is the same? What is different?

How do you know… Why do you know…

Explain why…

$$17 + 10 > 17 + 8$$

Is the statement true or false?

1 ten and 12 ones is greater than 2 tens.

How do you know?

Calculate 8×5

Tick (✓) which of the statements below are true.

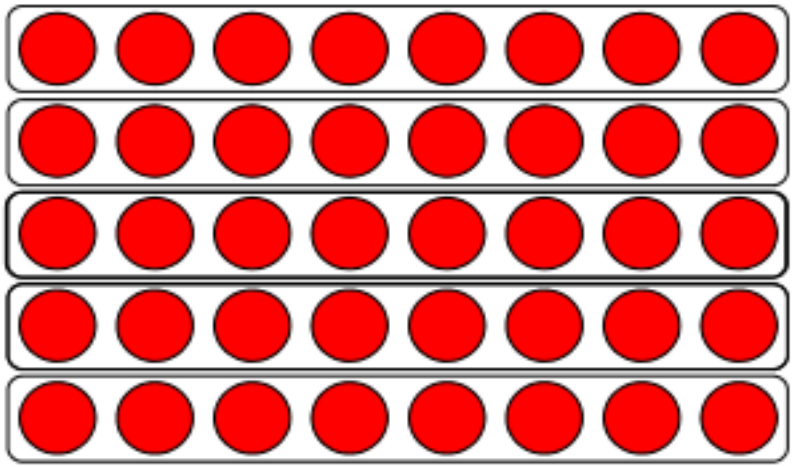
$8 \times 5 = 8 + 8 + 8 + 8 + 8$ ☐

$8 \times 5 = 16 + 8 + 8 + 8$ ☐

$8 \times 5 = 16 + 16 + 8$ ☐

$8 \times 5 = 40$ ☐

Calculate 8 × 5



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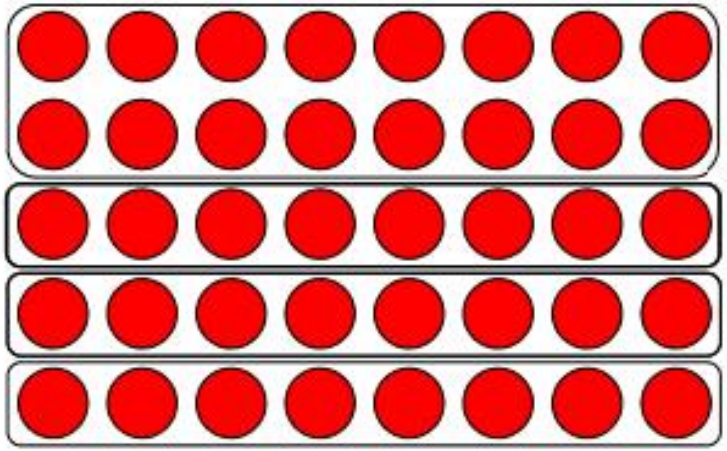
- $8 \times 5 = 16 + 8 + 8 + 8$ ☐
- $8 \times 5 = 16 + 16 + 8$ ☐
- $8 \times 5 = 40$ ☐

If you know this, what else do you know?

Calculate 8 × 5



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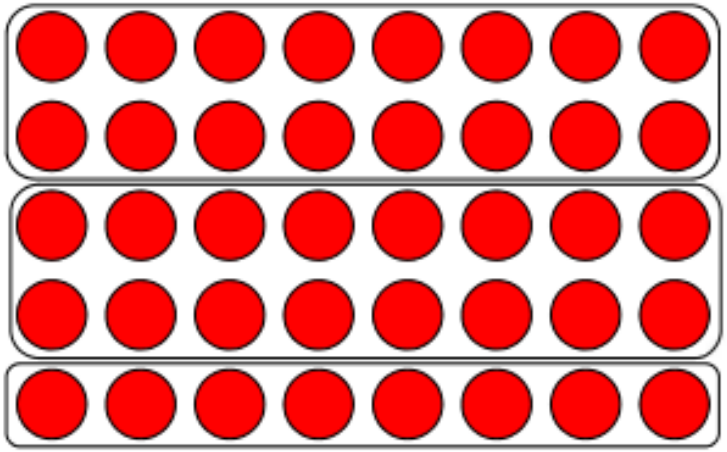

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$8 \times 5 = 16 + 16 + 8$ ☐

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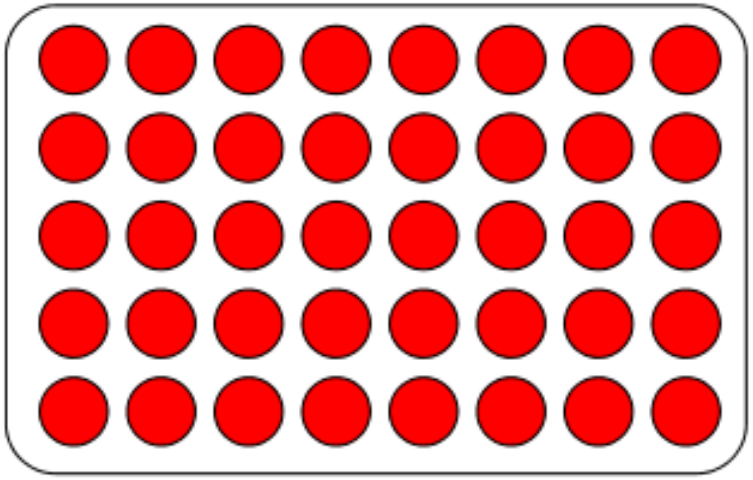

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$8 \times 5 = 16 + 8 + 8 + 8$ ☐

$8 \times 5 = 16 + 16 + 8$ ☐

$8 \times 5 = 40$ ☐

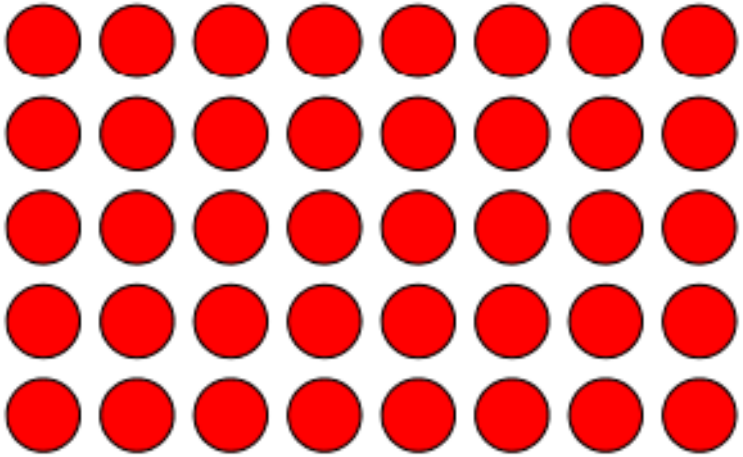
If you know this, what else do you know?

$5 + 5 + 5 + 5 + 5 + 5 + 5 + 5$

$20 + 20$

$10 + 10 + 10 + 10$

$5^2 + 5 \times 3$



4×10

$5^2(1 + \frac{3}{5})$

2×20

$4^2 + 4^2 + 8$

$2\,(4^2 + 4)$

$4^2 + 4^2 + 2 \times 4$

Multiplication Grid

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Multiplication

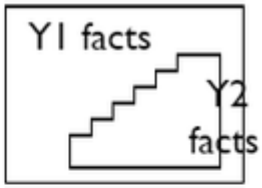
MathsHUBS

	1	2	3	4	5	6	7	8	9	10	11	12
1	1											
2	2	4										
3	3	6	9									
4	4	8	12	16								
5	5	10	15	20	25							
6	6	12	18	24	30	36						
7	7	14	21	28	35	42	49					
8	8	16	24	32	40	48	56	64				
9	9	18	27	36	45	54	63	72	81			
10	10	20	30	40	50	60	70	80	90	100		
11	11	22	33	44	55	66	77	88	99	110	121	
12	12	24	36	48	60	72	84	96	108	120	132	144

78 facts the coloured ones are 42 of them... 36 left,
nines trick.... 30 left...
elevens... 24 left...
square numbers... 17 left...

Adding 1 | Bonds to 10 | Adding 10 | Bridging/ compensating

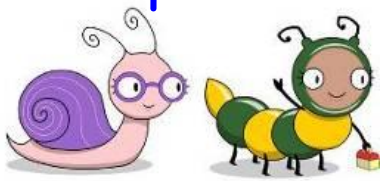
Adding 2 | Adding 0 | Doubles | Near doubles

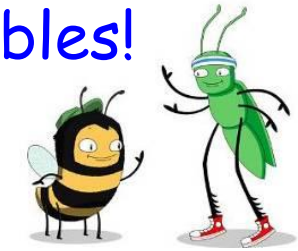


+	0	1	2	3	4	5	6	7	8	9	10
0	0 + 0	0 + 1	0 + 2	0 + 3	0 + 4	0 + 5	0 + 6	0 + 7	0 + 8	0 + 9	0 + 10
1	1 + 0	1 + 1	1 + 2	1 + 3	1 + 4	1 + 5	1 + 6	1 + 7	1 + 8	1 + 9	1 + 10
2	2 + 0	2 + 1	2 + 2	2 + 3	2 + 4	2 + 5	2 + 6	2 + 7	2 + 8	2 + 9	2 + 10
3	3 + 0	3 + 1	3 + 2	3 + 3	3 + 4	3 + 5	3 + 6	3 + 7	3 + 8	3 + 9	3 + 10
4	4 + 0	4 + 1	4 + 2	4 + 3	4 + 4	4 + 5	4 + 6	4 + 7	4 + 8	4 + 9	4 + 10
5	5 + 0	5 + 1	5 + 2	5 + 3	5 + 4	5 + 5	5 + 6	5 + 7	5 + 8	5 + 9	5 + 10
6	6 + 0	6 + 1	6 + 2	6 + 3	6 + 4	6 + 5	6 + 6	6 + 7	6 + 8	6 + 9	6 + 10
7	7 + 0	7 + 1	7 + 2	7 + 3	7 + 4	7 + 5	7 + 6	7 + 7	7 + 8	7 + 9	7 + 10
8	8 + 0	8 + 1	8 + 2	8 + 3	8 + 4	8 + 5	8 + 6	8 + 7	8 + 8	8 + 9	8 + 10
9	9 + 0	9 + 1	9 + 2	9 + 3	9 + 4	9 + 5	9 + 6	9 + 7	9 + 8	9 + 9	9 + 10
10	10 + 0	10 + 1	10 + 2	10 + 3	10 + 4	10 + 5	10 + 6	10 + 7	10 + 8	10 + 9	10 + 10

Another way to support your children is by using:

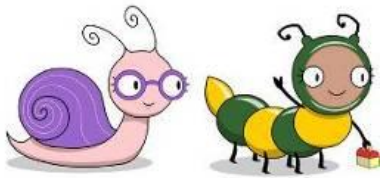
When it comes to times tables, speed AND accuracy are important — the more facts your child remembers, the easier it is for them to do harder calculations. Times Table Rock Stars is a fun and challenging programme designed to help students master the times tables. World Famous musicians need to practice and so do children with their tables!

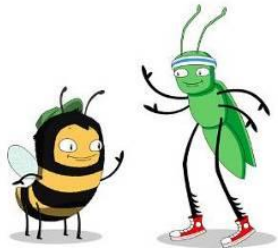


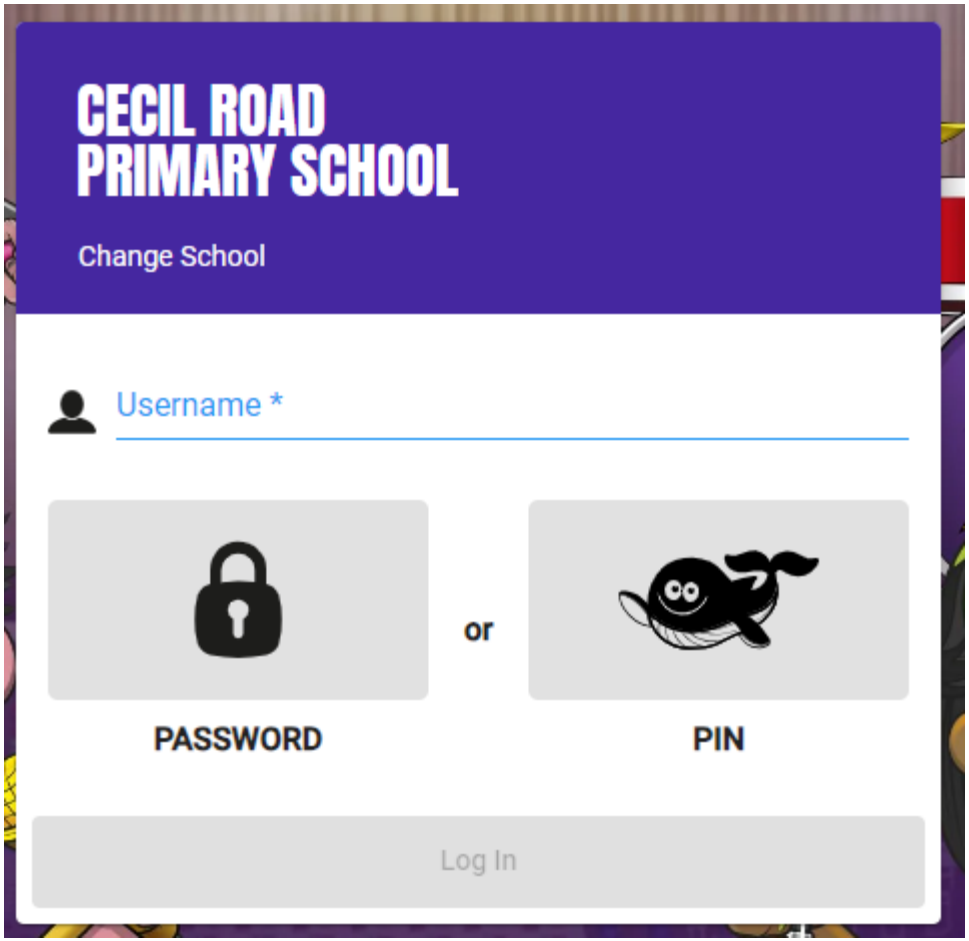


Another way to support your children is by using:

For your child to be fully motivated and for them to get the best out of the practice, they need your help - your praise, reminders and support will help your child feel confident and motivated.



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How can I help my child at home?

- ***Create a positive view of mathematics – be a mathematician together***
- ***learn times tables together***
- ***tell the time***
- Help your child to understand the importance of mathematics in everyday life
- Support your child when learning basic skills such as number bonds, counting in equal steps and tables
- Help them to see the value of learning these skills
- Value homework activities even if you think your child knows it. They must be fluent and able to apply the skills if learning is to be sustainable

Thank you for listening.
We hope the workshop helps you understand how you can support your child at home.