Welcome to the Maths Morning
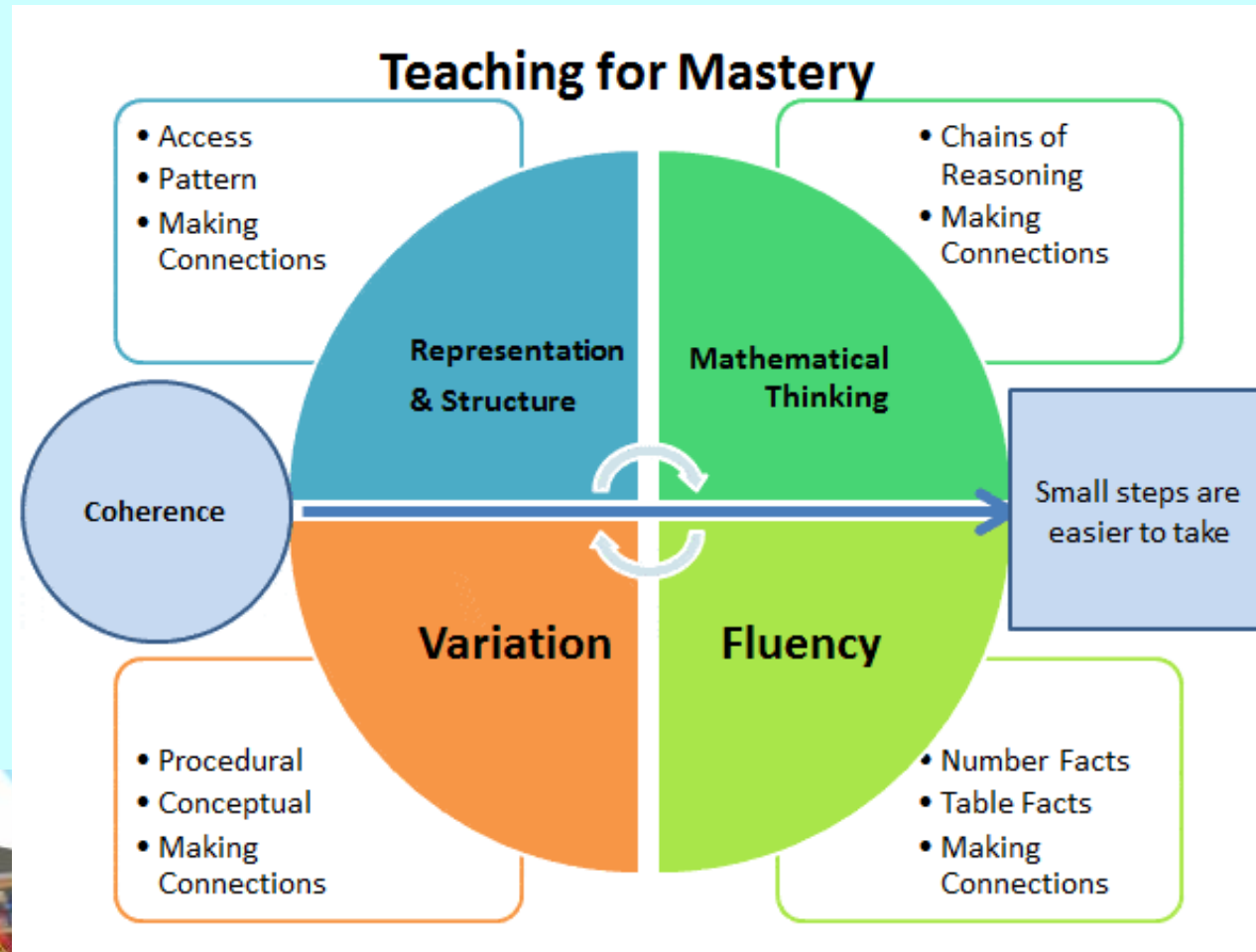
Mrs Hall and Miss Mapleston

Maths Co-ordinators

How we teach maths at The Hawthorns

Teaching for Mastery
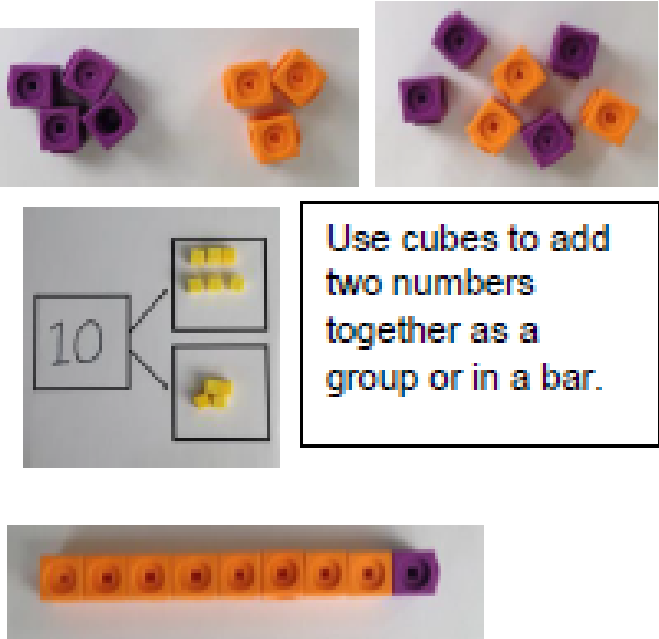
- Access
- Pattern
- Making Connections

- Chains of Reasoning
- Making Connections

Representation & Structure

Mathematical Thinking

Coherence

Small steps are easier to take

Variation

Fluency

- Procedural
- Conceptual
- Making Connections

- Number Facts
- Table Facts
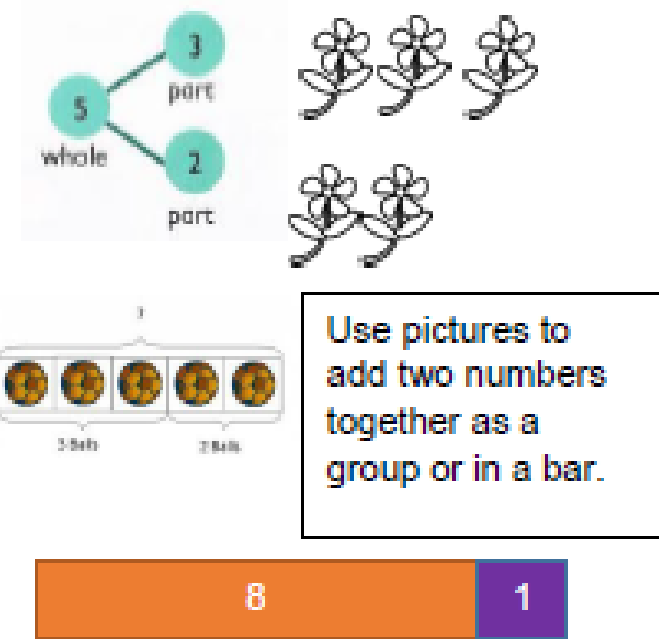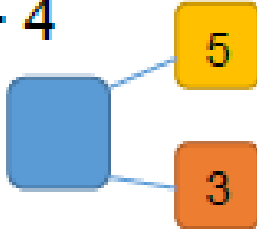- Making Connections
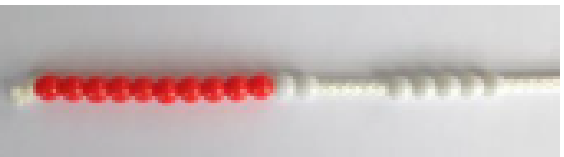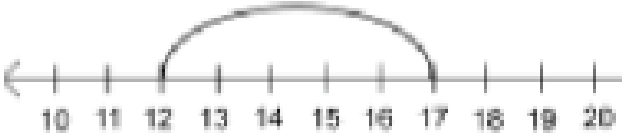
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What is the mastery approach?

- An expectation that all pupils can and will achieve to the best of their ability.
- The large majority of pupils progress through the curriculum content at the same pace.
- Lessons, resources and questions are crafted carefully to foster deep conceptual and procedural knowledge.
- Practise and consolidation play a central role. Well designed variation builds fluency and understanding of underlying mathematical concepts in tandem.
- Teachers use precise questioning to check conceptual and procedural knowledge as well as challenging the children to explore connections and apply their learning.

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Content of learning

CONCRETE · **PICTORIAL** · **ABSTRACT**

$2 + 1 = 3$

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Objective and Strategies	Concrete	Pictorial	Abstract
Combining two parts to make a whole: part-whole model	Use cubes to add two numbers together as a group or in a bar.	Use pictures to add two numbers together as a group or in a bar.	$4 + 3 = 7$ $10 = 6 + 4$ 5 3 Use the part-part whole diagram as shown above to move into the abstract.
Starting at the bigger number and counting on	Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.	$12 + 5 = 17$ 10 11 12 13 14 15 16 17 18 19 20 Start at the larger number on the number line and count on in ones or in one jump to find the answer.	$5 + 12 = 17$ Place the larger number in your head and count on the smaller number to find your answer.

Maths lessons at The Hawthorns

- Memory map to retrieve previous learning and address misconceptions.
- Cold tasks to inform planning.
- A ping pong approach to engage and challenge.
- Fluency to embed the skills.
- Reasoning and problem solving to deepen understanding.
- A.P.E challenge.

Fluency

Maths fluency means that children will be able to use their skills to know the best way to figure out a maths problem. It also means developing number sense and allows them to use their skills in a variety of contexts. The questions we use are carefully selected to ensure that they are challenging whilst still allowing the children time to apply their skills.

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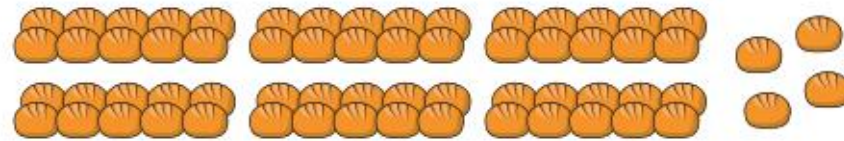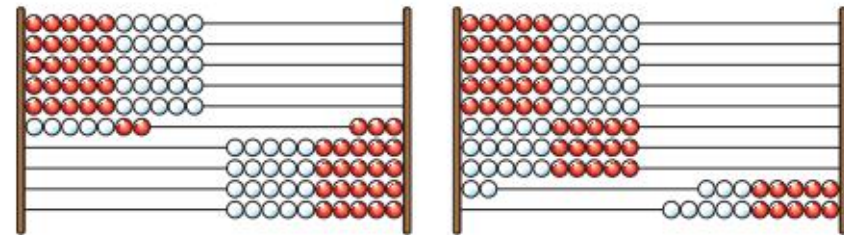Primary School

Examples of fluency

Year 1

Which pictures show 20?
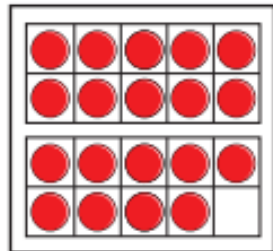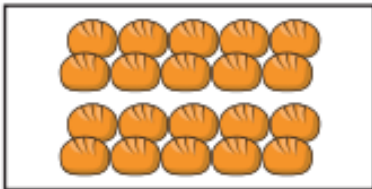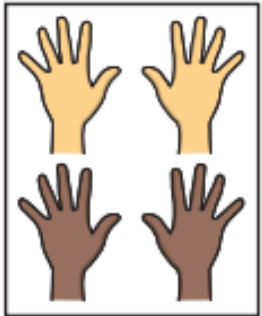
Year 2

- How many bread rolls are there?

How do you know?

- What number is shown on each Rekenrek?
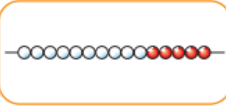
How do you know?

Year 3

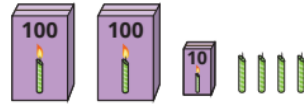Match the pictures to the numbers.

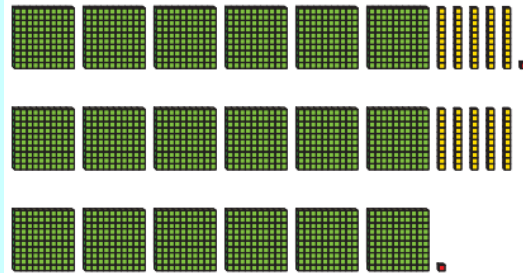- 1 ten and 5 ones
- thirty-five
- 25

Year 4

How many candles are there?

Write your answer in numerals and words.

What numbers are represented?

Year 5

What numbers are shown?
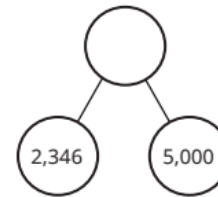
Th	H	T	O

Year 6

What is the value of the digit 4 in each of the numbers in the place value chart?

Thousands			Ones		
H	T	O	H	T	O
		4	3	2	7
	3	5	4	0	2
2	4	7	1	9	8
8	1	2	5	4	3

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Reasoning and Problem Solving

Mathematical reasoning involves thinking through mathematical problems logically in order to arrive at solutions. It also involves being able to identify what is important and unimportant in solving a problem. We challenge our children to find multiple solutions, or identify patterns to deepen their understanding. They are also encouraged to justify or prove their answers.

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True or false?

321

10 100 1

10 100

10

1

10 10

100 100 100

100 100 100 10

1 1 1 1 1

1 1 1 1 1 1
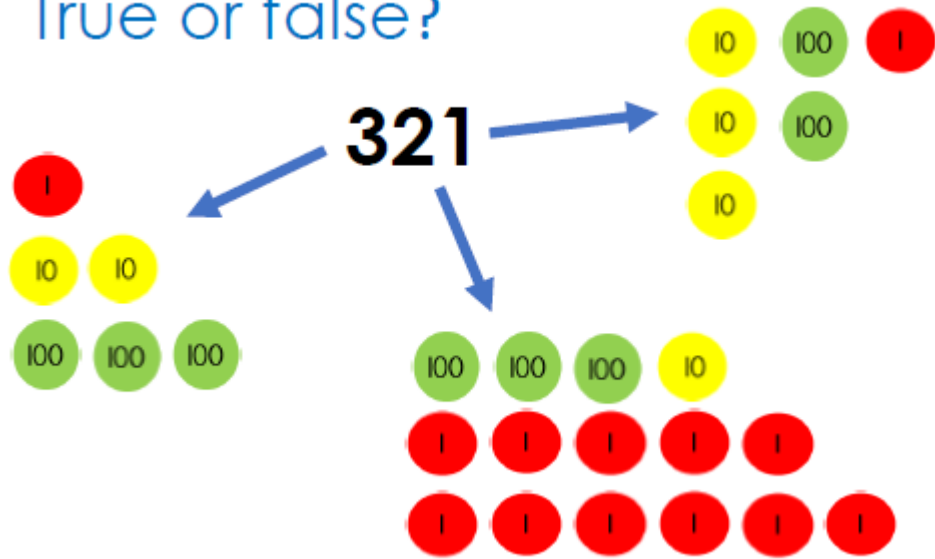
Which answer?

Which number is 10 more than 396?

(a) 496

(b) 386   *Explain your choice*

(c) 406

Different ways

10 > ☐ + 6

10 > ☐ + 6

10 > ☐ + 6

How many ways?

$$\frac{\square}{8} + \frac{1}{\square} = \frac{\square}{4}$$

The answer must be a proper fraction

Level 1: I can find a way

Level 2: I can find different ways

Level 3: I know how many ways there are

Different ways

To calculate 85% of 260 you have worked out:

50% = 130

25% = 65
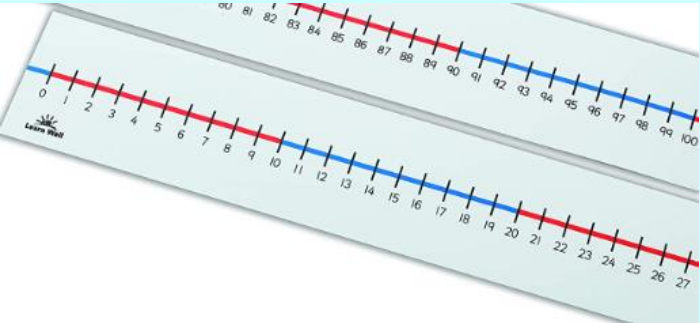
10% = 26

5% = 13

Using this information, calculate 85% of 260 in three different ways.

Representations we use in school – bar models and whole part models.

$$4+13=$$
$$17-4=$$
$$17-13=$$
$$13+4=$$

£138

6 meals

95

80 12 3

95

80 15

17	
4	13

Hundreds	Tens	Ones
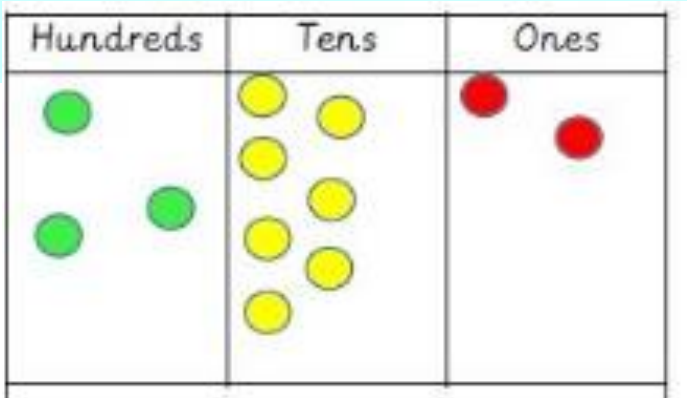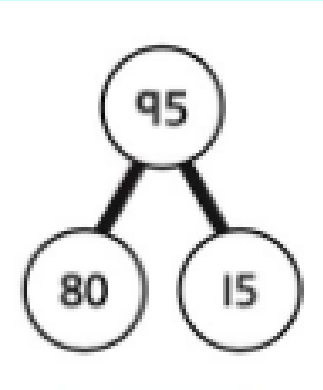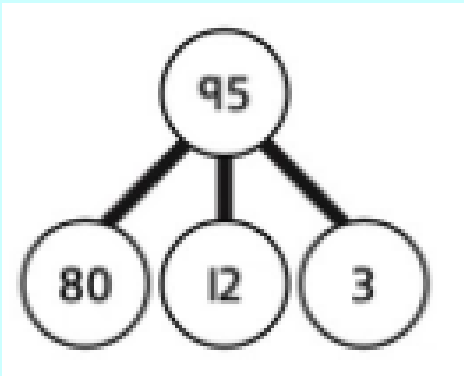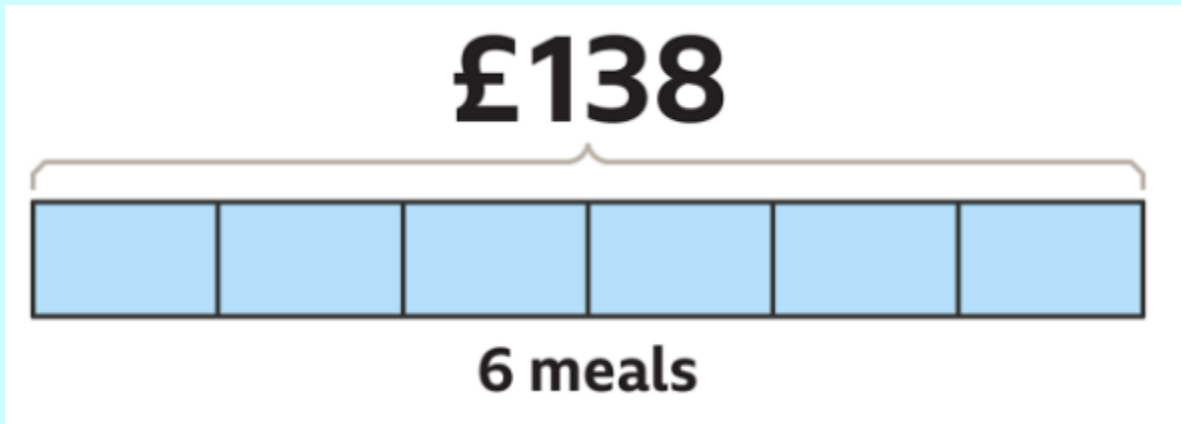
Examples of reasoning and problem solving

Year 1

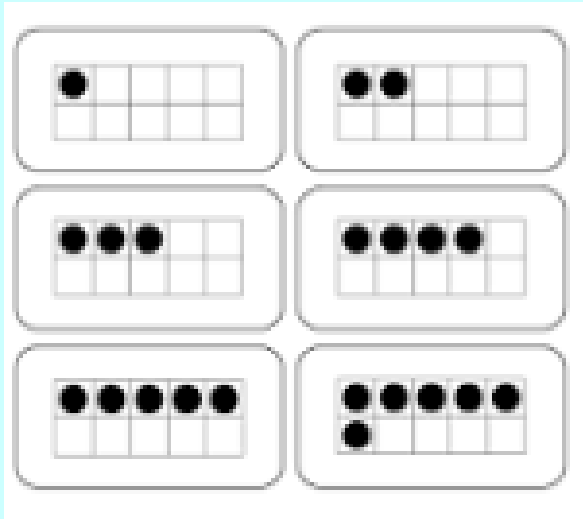Tiny has these digit cards.

1 2 3 4 5

6 7 8 9

I can use the cards to make all the numbers from eleven to twenty.

Do you agree with Tiny?

Why?

Year 2

There are 43 straws.

What mistake has Tiny made?

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Year 3

Teddy has used base 10 to make the number 420

Some of the base 10 pieces are covered up.
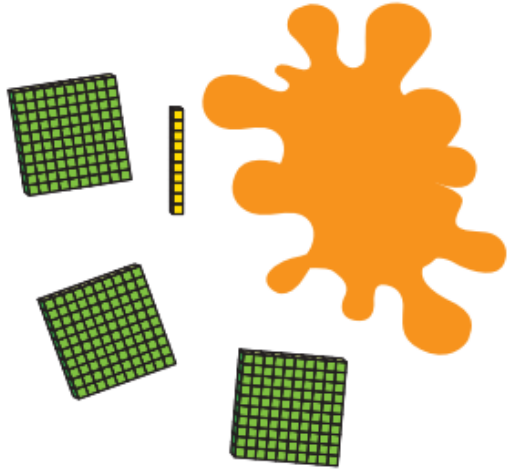
Work out the amount that is covered up.

Find some different ways you can make the missing amount using base 10

Year 4

10 10 1
10 10 1 100

This is the number 421

What mistake has Dora made?

What is the number?

Year 5

Filip has made five numbers using the digits 1, 2, 3 and 4

He is using a letter to represent each digit.

Here are his numbers.

AABCD
ACDCB
DCABA
CDADC
BDAAB

Use the clues to work out each number.

- The first number in the list is the greatest number.
- The digits in the fourth number add up to 12
- The third number is the smallest number.

Year 6

Are the statements true or false?

Adding ten thousand to a number only ever changes the digits in exactly one column.

The number consisting of 70 thousands and 400 ones is 700,400

3 ten-thousands is the same as 30 thousands.

400 hundreds is the same as 4 ten-thousands.

A large number added to a large number is always a large number.

A large number subtracted from a large number is always a large number.

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Ensuring challenge for all

- Questioning which encourages the children to think deeply.
- Every lesson has an A.P.E. question.
- Use of stem sentences.
- Flexible groupings if necessary.

How many ways?

Complete using digits 1-9. Use the 7 as shown.

$\boxed{}\,7 = \boxed{} + \boxed{} + \boxed{} + \boxed{}$

Level 1: I can find a way
Level 2: I can find different ways
Level 3: I know how many ways there are

A.P.E. Answer it

What is the answer to the question you've been asked?

Prove it

Show how you know that is the answer with pictures, diagrams, calculations or in another way.

Explain it

Write some sentences which make it clear why you came to your answer.

@MRSPTEACH

Different ways

What could the start and end numbers be?

4 620

Breaking it down:	Proving/Reasoning:	Reflective
I noticed that ____ .	The answer is ____ .	This idea reminds me of ____ .
I predict that ____ .	This is true because ____ .	I can use ____ to help me with ____ .
One thing the same ____ This could help me by ____	This is false because ____ The correct answer is ____	I think that makes sense/doesn't make sense because ____ .
One thing different ____ This could help me by ____	The mistake I noticed is ____ They needed to/should have____	A new Maths concept I learned today was ____ .
My first step is ____ .	I can prove my answer by ____ .	It is important to remember to ____ .
Another strategy would be _____ .	Another representation of this would be ____ .	A common mistake I make is ____ .
		Next time I solve a problem like this I will ____ .
The most efficient strategy would be ____ .	Another method to calculate this could be ____ .	I still have a question about _____ .
		What would happen if _____ ?

Example

Dip and pick questions

On Monday morning there were 2 of each type of cake.
A victoria sponge divided into quarters.
A chocolate cake divided into thirds.
A carrot cake divided into twelfths.
At the end of lunch time the following had been sold:
6 pieces of carrot cake
2 pieces of chocolate cake
3 pieces of victoria sponge
What was the total amount of cake left
for afternoon tea?

What if...

...Rose the cake shop owner has 19 cakes to give away to her 3 friends.
$\frac{1}{2}$ to Pat, $\frac{1}{4}$ to Jane and $\frac{1}{5}$ to Kim.
How many of the cakes does each person get?
Is there a way Rose could have shared out her cakes in the same way between her friends without cutting them up into pieces?

CARD 3

A café makes 6 fruit pies.

The pies are cut up into eighths and each piece is sold separately.

How many pieces of fruit pie could be sold?

A café has 3 types of
cakes for sale which are equal in size.
A victoria sponge divided into quarters.
A chocolate cake divided into thirds.
A carrot cake divided into twelfths.
Karen buys the equivalent of 1 full cake which is made up of at least one piece of each type of cake.
What are the possible combinations of the pieces of the cakes that Karen
could buy?

A café makes 6 fruit pies.
The pies are cut up into eighths and each piece is sold separately.
How many pieces of fruit pie could be sold?
The café sells 26 pieces of fruit pie.
What was the total amount of fruit pie left?

A café makes 6 fruit pies.
The pies are cut up into eighths and each piece is sold separately.
The café sells 26 pieces of fruit pie.
What was the total amount of fruit pie left?

Lesley said she had bought in total $2\frac{2}{3}$ cakes.
She said that she had at least $\frac{3}{4}$ of each type of cake.
Is Lesley correct?
Explain how you know.

What if...

Less straight forward

Finding all possibilities

Explain

Instructions left out

More steps

Simple

+/- fractions X tables

tts

MA03179

Year 4 Multiplication Check (June)

- The purpose of the check is to determine whether your child can fluently recall their times tables up to 12, which is essential for future success in mathematics. It will also help your child's school to identify if your child may need additional support.

- It is an on-screen check consisting of 25 times table questions. Your child will be able to answer 3 practice questions before taking the actual check. They will then have 6 seconds to answer each question. On average, the check should take no longer than 5 minutes to complete.

How can you support at home?

- Times tables Rockstars (Year 2 and above)
- Practice times tables
- Purple Mash
- Top Marks (Hit the button)
- Maths in real life context – baking, shopping, time

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