Welcome to our Maths Workshop

Y5/Y6

Session aims:

- What does maths look like in Y5 and Y6?
- How is maths taught at Birley Primary Academy?
- How can children be supported?

At Birley Primary Academy, our shared vision for mathematics is:

· To foster a sense of curiosity and excitement about the subject
· For every child to develop their mathematical fluency and to be able to reason and problem solve confidently.
· To provide a context for learning to ensure children develop an understanding of how mathematics is used in the wider world
· To provide a mathematics curriculum where children continually build on the knowledge they have already mastered and are able to make rich connections across mathematical ideas
· To enable children to confidently reason about their mathematics by promoting the use of accurate mathematical language
· To secure children's knowledge and accuracy when recalling number facts
· To develop children's mathematical thinking by using a range of models to support learning e.g. concrete manipulatives and pictorial representations, before moving onto abstract symbols
· To promote enjoyment of learning through practical activity, exploration and discussion
· To build resilience and promote a positive growth mind set in mathematics

What are the National Curriculum Programmes of Study?

The link below will take you to the programmes of study for each year group. This shows you what your child will be learning when at school and what a child of that age is expected to achieve by the end of the year (Age Related Expectations).

National Curriculum Programmes of Study for Key Stage 1 and Key Stage 2

Y5 Programme of Study:

One Page Version

YEAR 5

Maths Objectives

Number and Place Value

- I can read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit.
- I can count forwards or backwards in steps of powers of 10 for any given number up to 1000000
- I can interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero.
- I can round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and
- 100000.
- I can solve number problems and practical problems that involve all of the above.
- I can read Roman numerals to 1000 (M) and recognise years written in Roman numerals.

Addition and Subtraction

- I can add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction).
- I can add and subtract numbers mentally with increasingly large numbers.
- I can use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.
- I can solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Geometry- Properties of Shape

- I can identify 3-D shapes, including cubes and other cuboids, from 2-D representations.
- I can use the properties of rectangles to deduce related facts and find missing lengths and angles.
- I can distinguish between regular and irregular polygons based on reasoning about equal sides and angles.
- I can know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles.
- I can draw given angles, and measure them in degrees (^{o}).
- I can identify angles at a point and one whole turn (total 360^{o}).
- I can identify angles at a point on a straight line and half a turn (total 180^{o}).

Fractions

- I can compare and order fractions whose denominators are all multiples of the same number.
- I can identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.
- I can recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number
- I can add and subtract fractions with the same denominator and denominators that are multiples of the same number.
- I can multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.
- I can read and write decimal numbers as fractions (for example 0.71 = 71/100)
- I can recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.
- I can round decimals with two decimal places to the nearest whole number and to one decimal place
- I can read, write, order and compare numbers with up to three decimal places.
- I can solve problems involving number up to three decimal places.
- I can recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal.
- I can solve problems which require knowing percentage and decimal equivalents of 1/2, 1/4, 1/5, 2/5, 4/5 and fractions with a denominator of a multiple of 10 or 25

Multiplication and Division

- I can identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.
- I can know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.
- I can establish whether a number up to 100 is prime and recall prime numbers up to 19.
- I can multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers.
- I can multiply and divide numbers mentally drawing upon known facts.
- I can divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context.
- I can multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.
- I can recognise and use square numbers and cube numbers, and the notation for squared
- (2) and cubed(3).
- I can solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes.
- I can solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign.
- I can solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Measurement

- I can convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre).
- I can understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints.
- I can measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres.
- I can calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes.
- I can estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water].
- I can solve problems involving converting between units of time.
- I can use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.

Position and Direction

- I can identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed

Statistics

- I can solve comparison, sum and difference problems using information presented in a line graph
- I can complete, read and interpret information in tables, including timetables

Y6 Programme of Study:

Number and Place Value

- I can read, write, order and compare numbers up to 10 000 000 and determine the value of each digit.
- I can round any whole number to a required degree of accuracy.
- I can use negative numbers in context and calculate intervals across zero.
- I can solve number and practical problems that involve all of the above.

Addition and Subtraction

- I can solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
- I can perform mental calculations, including with mixed operations and large numbers.
- I can use their knowledge of the order of operations to carry out calculations involving the four operations.
- I can solve problems involving addition, subtraction, multiplication and division use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

Geometry- Properties of Shape

- I can draw 2-D shapes using given dimensions and angles.
- I can recognise, describe and build simple 3-D shapes, including making nets.
- I can compare and classify geometric shapes based on theirproperties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.
- I can illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.
- I can recognise angles where they meet at a point, are on a straight line, or are vertically opposite and find missing angles.

Multiplication and Division

- I can multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.
- I can divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.
- I can divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context.
- I can identify common factors, common multiples and prime numbers.
- I can perform mental calculations, including with mixed operations and large numbers.
- I can use my knowledge of the order of operations to carry out calculations involving the four operations.
- I can solve problems involving addition, subtraction, multiplication and division.
- I can use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

Fractions

- I can use common factors to simplify fractions; use common multiples to express fractions in the same denomination.
- I can compare and order fractions, including fractions > 1
- I can add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.
- I can multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, 1/4 x 1/2 = 1/8].
- I can divide proper fractions by whole numbers [for example, 1/3 ÷ 2= 1/6].
- I can associate a fraction with division and calculate decimalfraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8].
- I can identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places.
- I can multiply one-digit numbers with up to two decimal places by whole numbers.
- I can use written division methods in cases where the answer has up to two decimal places.
- I can solve problems which require answers to be rounded to specified degrees of accuracy.
- I can recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

Measurement

- I can solve problems involving the calculation and conversion of units of measure, using decimal notation, up to three decimal places where appropriate.
- I can use, read, write and convert between standard units, converting measurements of length mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places.
- I can convert between miles and kilometres.
- I can recognise that shapes with the same areas can have different perimeters and vice versa.
- I can recognise when it is possible to use formulae for area and volume of shapes.
- I can calculate the area of parallelograms and triangles.
- I can calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3].

Position and Direction

- I can describe positions on the full coordinate grid (all four quadrants).
- I can draw and translate simple shapes on the coordinate plane and reflect them in the axes.

Statistics

- I can interpret and construct pie charts and line graphs and use these to solve problems.
- I can calculate and interpret the mean as an average.

Ratio and Proportion

- I can solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.
- I can solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison.
- I can solve problems involving similar shapes where the scale factor is known or can be found.
- I can solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

Algebra

- I can use simple formulae.
- I can generate and describe linear number sequences.
- I can express missing number problems algebraically.
- I can find pairs of numbers that satisfy an equation with two unknowns.
- I can enumerate possibilities of combinations of two variables.

YEAR 6

Maths Objectives

Coverage Throughout the Year

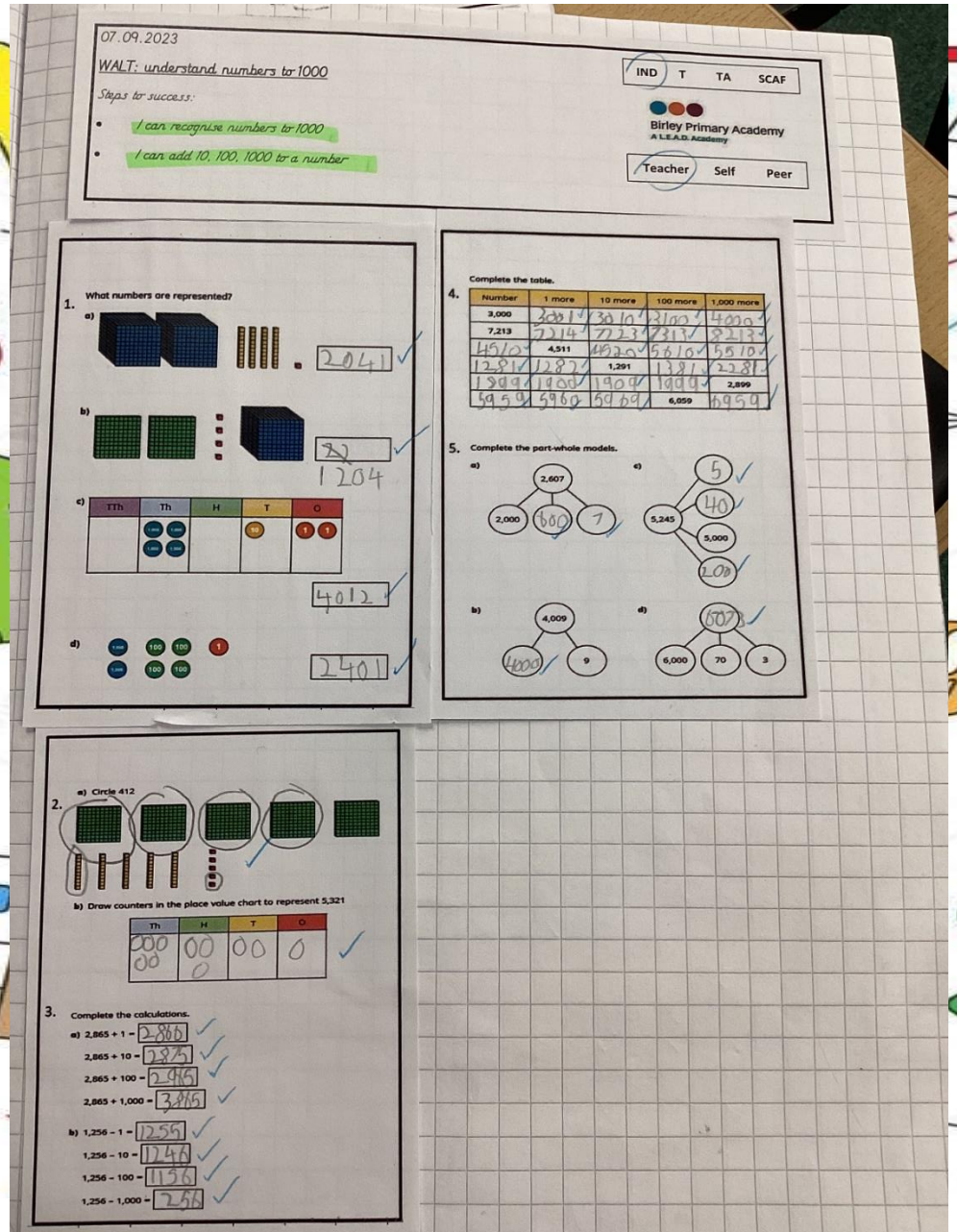
Maths lessons are carefully planned throughout the year to ensure full coverage of the National Curriculum Programmes of Study. Please see the overview below for Y5 and Y6.

Y5

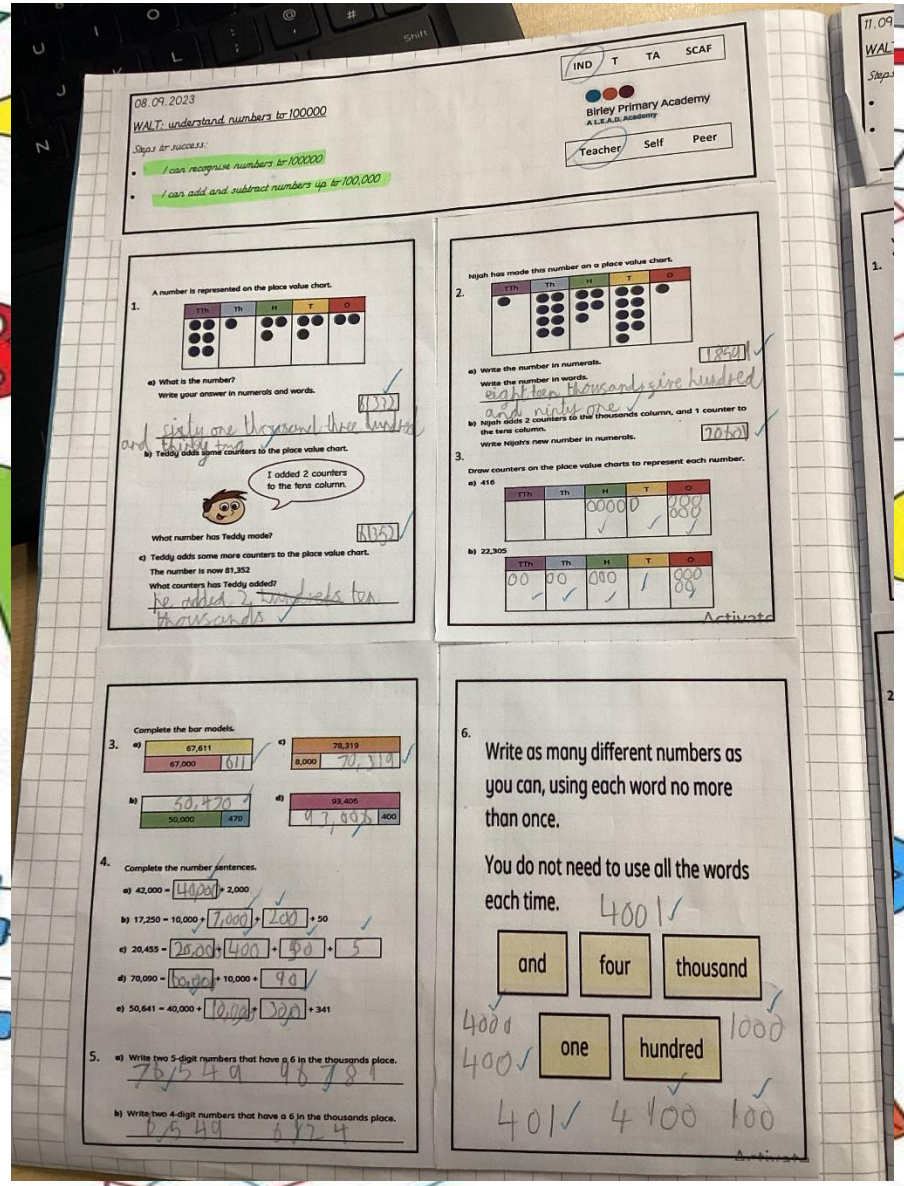
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Autumn 1	Number: Place Value			Number: Addition and Subtraction		Number: Multiplication and Division	
Autumn 2	Number: Multiplication and Division		Number: Fractions				Consolidation
Spring 1	Number: Multiplication and Division			Number: Fractions		Consolidation	
Spring 2	Number: Decimals and Percentages			Measurement: Perimeter and Area		Statistics	
Summer 1	Geometry: Shape			Geometry: Position and Direction		Number: Decimals	
Summer 2	Number: Decimals		Number: Negative Numbers	Measurement: Converting Units		Measurement: Volume	Consolidation

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Autumn 1	Number: Place Value			Number: Addition, Subtraction, Multiplication and Division			
Autumn 2	Number: Fractions				Measurement: Converting Units	Consolidation	
Spring 1	Number: Decimals		Number: Percentages		Number: Algebra		
Spring 2	Measurement: Area, Perimeter and Volume		Ratio		Geometry: Position and Direction		
Summer 1	Statistics		Geometry: Properties of Shape			Consolidation	
Summer 2	Consolidation						

What does work look like in Y5?



What does work look like in Y5?



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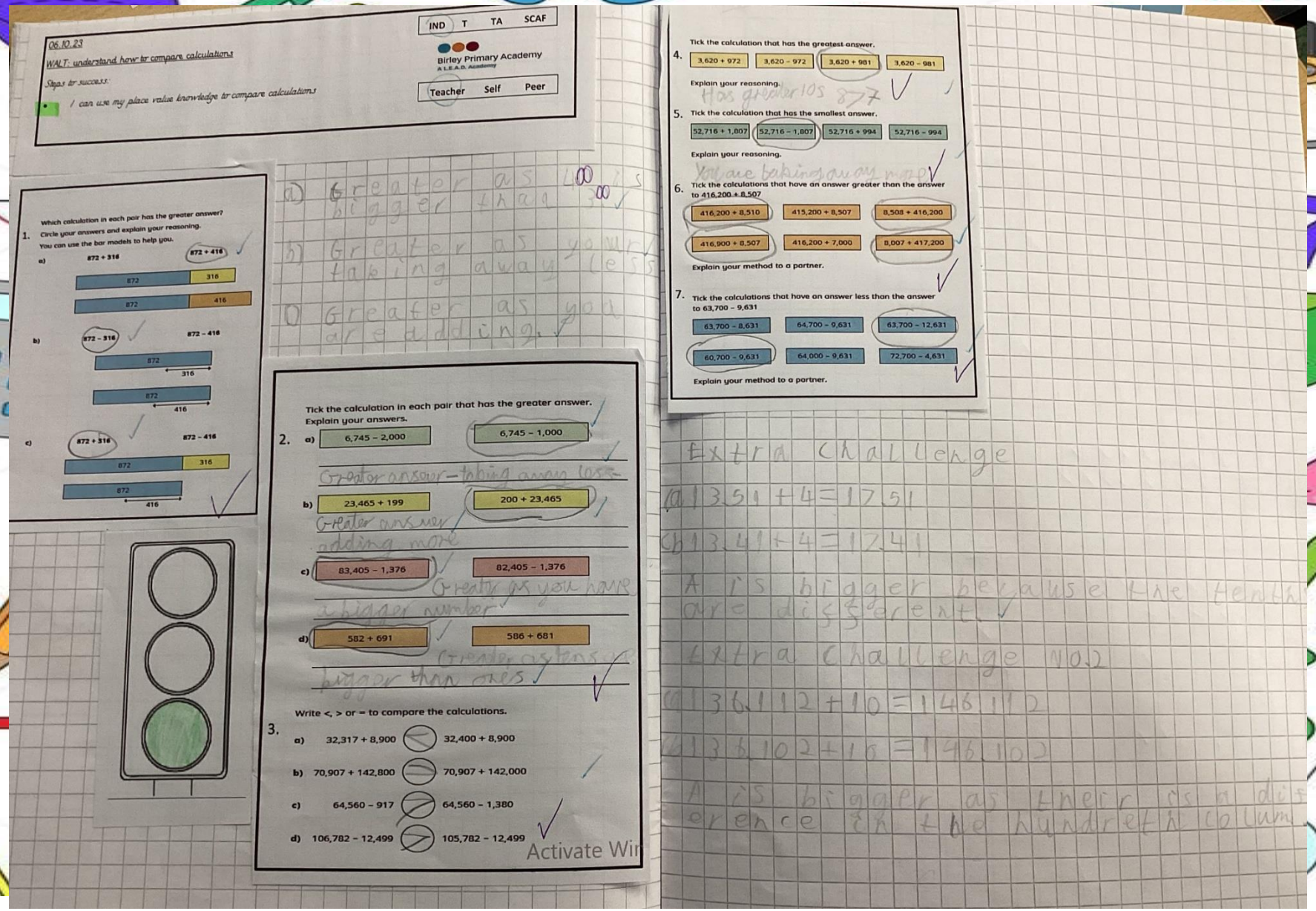
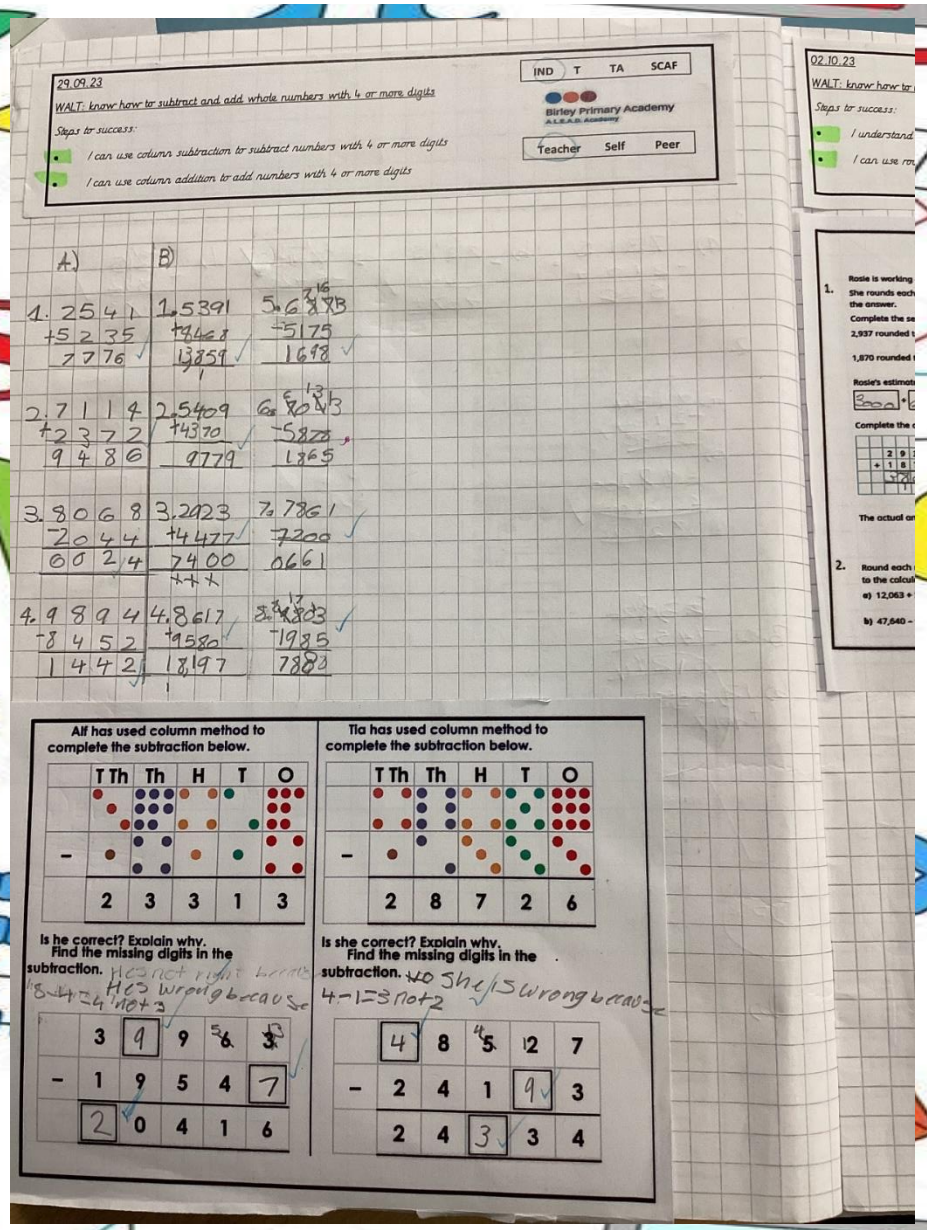
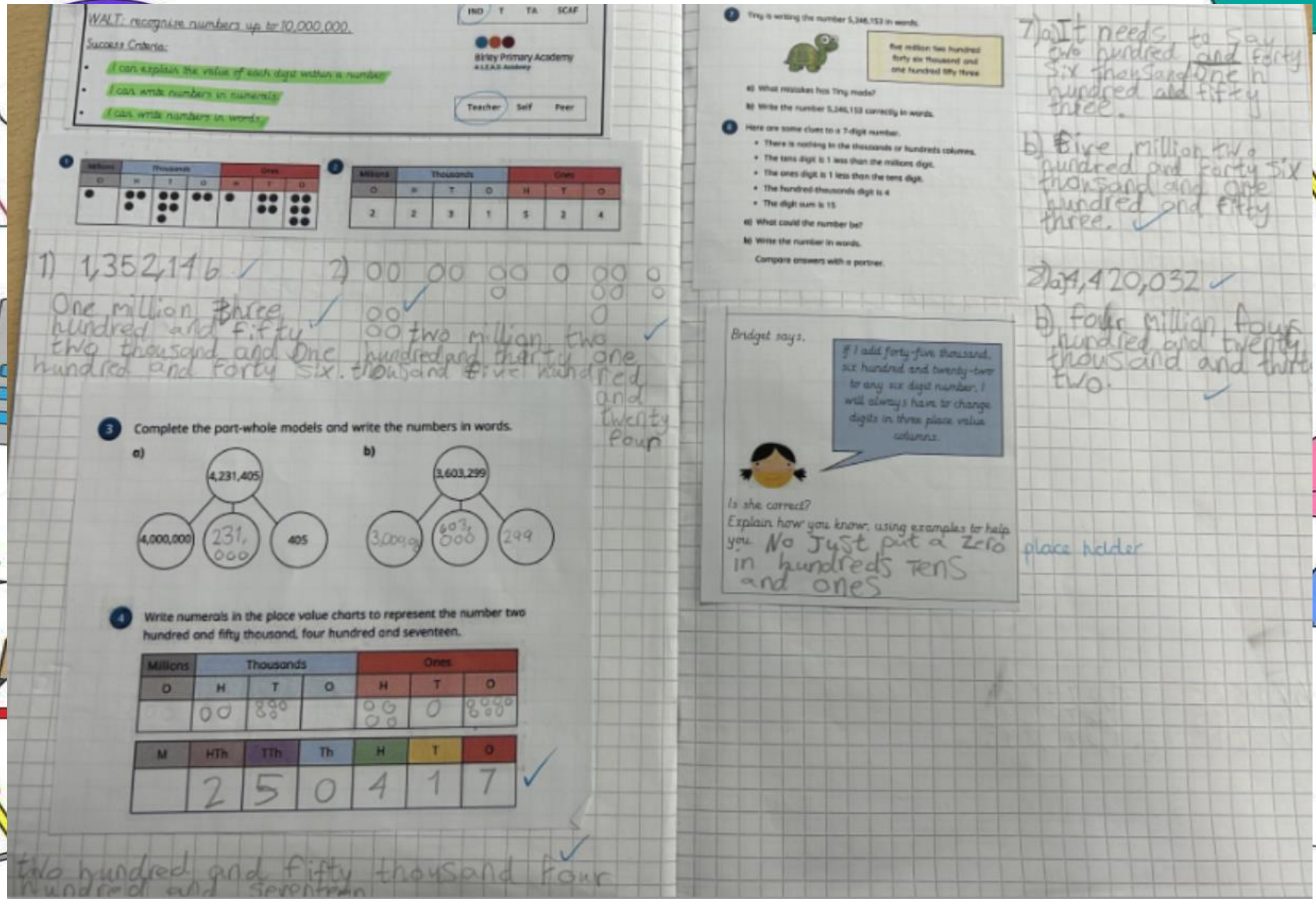


What does work look like in Y5?



What does work look like in Y6?



WALT: recognise numbers up to 10,000,000.

Success Criteria:

- I can explain the value of each digit within a number
- I can write numbers in numerals
- I can write numbers in words

IND T TA SCAF

Birkby Primary Academy

Teacher Self Peer

1) 1,352,146 ✓

One million three hundred and fifty two thousand and one hundred and forty six.

2) two million two hundred and thirty one thousand five hundred and twenty four

3 Complete the part-whole models and write the numbers in words.

a) 4,231,405 → 4,000,000 | 231,000 | 405

b) 3,603,299 → 3,000,000 | 603,000 | 299

4 Write numerals in the place value charts to represent the number two hundred and fifty thousand, four hundred and seventeen.

Millions	Thousands			Ones		
O	H	T	O	H	T	O
	00	800		00 00	0	8000 800

M	HTh	TTh	Th	H	T	O
	2	5	0	4	1	7

two hundred and fifty thousand four hundred and seventeen ✓

Tiny is writing the number 5,246,153 in words.

five million two hundred forty six thousand and one hundred fifty three

a) What mistakes has Tiny made?

b) Write the number 5,246,153 correctly in words.

5 Here are some clues to a 7-digit number.

- There is nothing in the thousands or hundreds columns.
- The tens digit is 1 less than the millions digit.
- The ones digit is 1 less than the tens digit.
- The hundred-thousands digit is 4
- The digit sum is 15

a) What could the number be?

b) Write the number in words.

Compare answers with a partner.

7)a) It needs to say two hundred and forty six thousand one hundred and fifty three.

b) five million two hundred and forty six thousand and one hundred and fifty three. ✓

8)a) 1,420,032 ✓

b) four million four hundred and twenty thousand and thirty two.

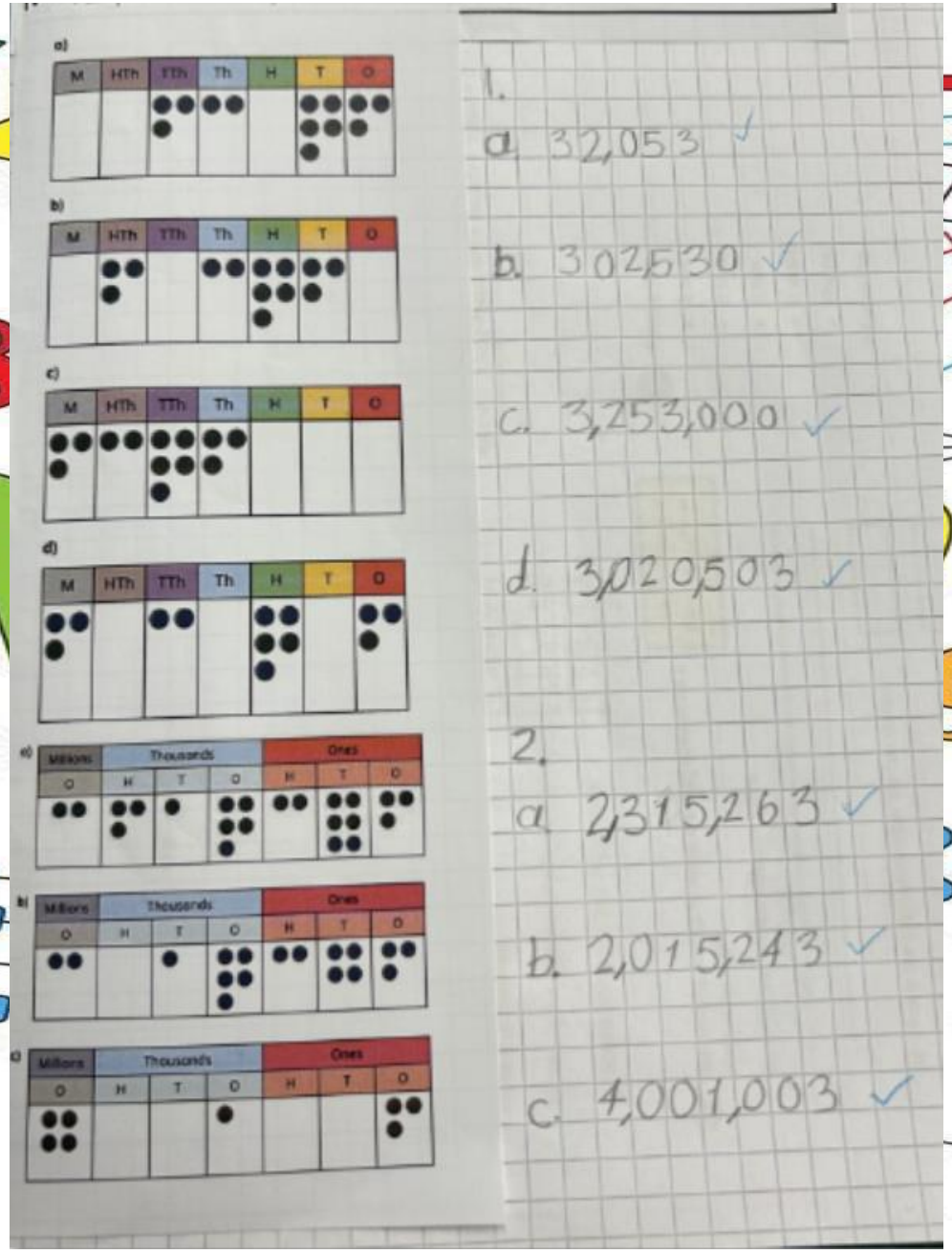
Bridget says,

If I add forty-five thousand, six hundred and twenty-two to any six digit number, I will always have to change digits in three place value columns.

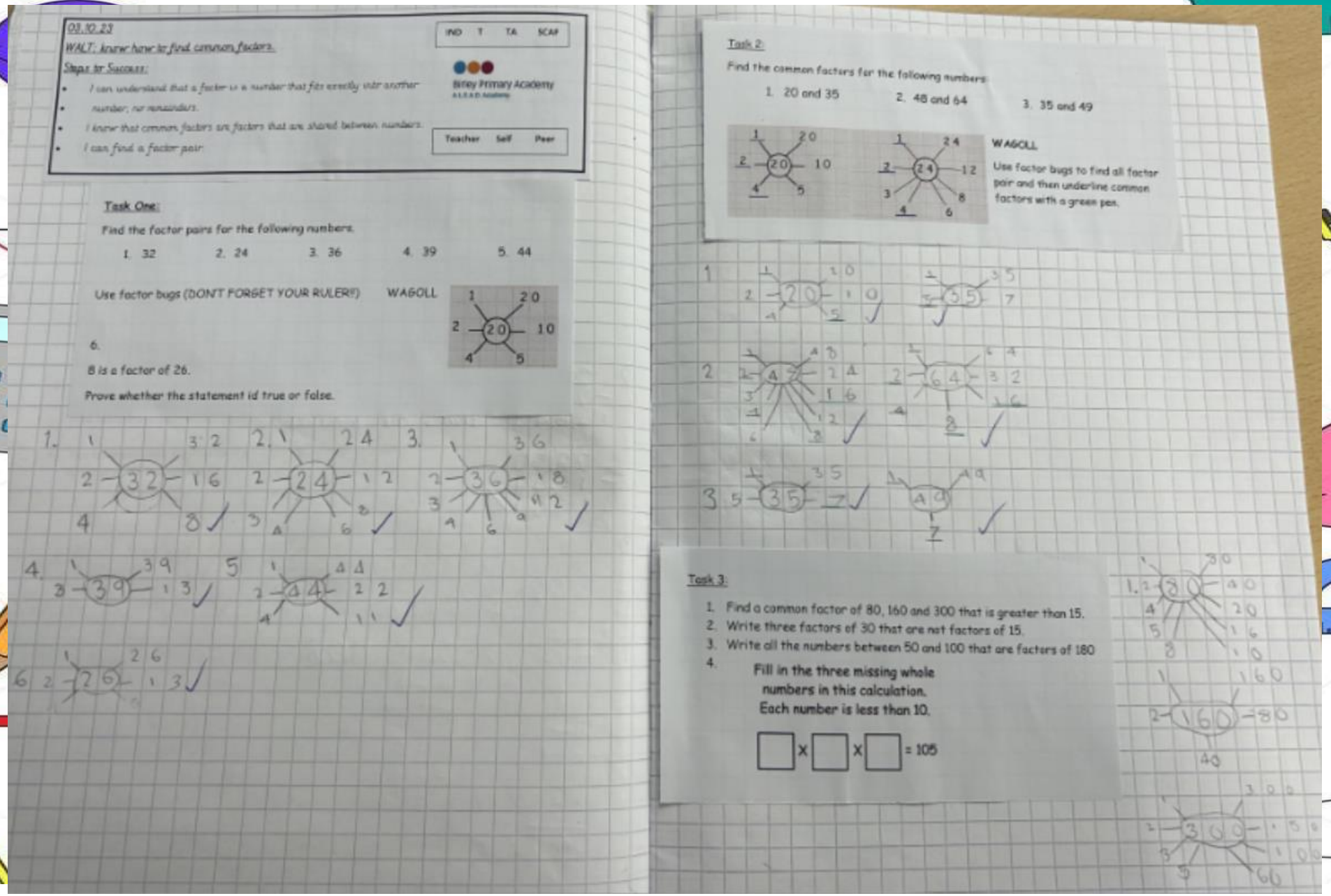
Is she correct?

Explain how you know, using examples to help you. No just put a zero in hundreds tens and ones place holder

What does work look like in Y6?



What does work look like in Y6?



03.10.23

WALT: know how to find common factors.

Steps to Success:

- I can understand that a factor is a number that fits exactly into another number; no remainders.
- I know that common factors are factors that are shared between numbers.
- I can find a factor pair.

IND T TA SCAF

Birley Primary Academy

Teacher Self Peer

Task One:

Find the factor pairs for the following numbers.

1. 32 2. 24 3. 36 4. 39 5. 44

Use factor bugs (DONT FORGET YOUR RULER!) WAGOLL

6.

8 is a factor of 26.

Prove whether the statement id true or false.

Task 2:

Find the common factors for the following numbers

1. 20 and 35 2. 48 and 64 3. 35 and 49

WAGOLL

Use factor bugs to find all factor pair and then underline common factors with a green pen.

Task 3:

1. Find a common factor of 80, 160 and 300 that is greater than 15.
2. Write three factors of 30 that are not factors of 15.
3. Write all the numbers between 50 and 100 that are factors of 180
4. Fill in the three missing whole numbers in this calculation. Each number is less than 10.

□ x □ x □ = 105

What does work look like in Y6?

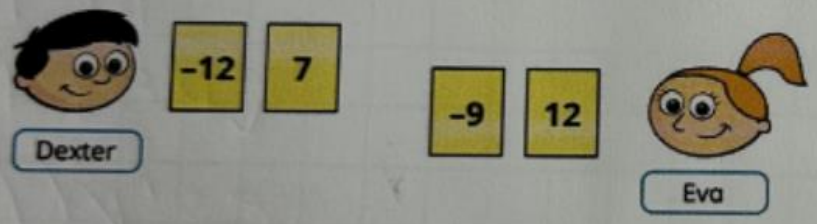
This table shows how the temperature changed in 3 different cities. Complete the table to show how the temperature changed over 3 months.

City	January	Temperature Change	February	Temperature Change	March
Toronto	-11.7°c	+12.2°c	0.5°c ✓	+5 °c	5.5°c ✓
Edinburgh	3 °c	-9.5°c ✓	-6.5 °c	1.2°c ✓	-7.7 °c
New York	-4 °c	5.3°c ✓	1.3 °c	0.7°c ✓	2 °c

Dexter and Eva are playing a game.

They each choose two cards and add up their total points.

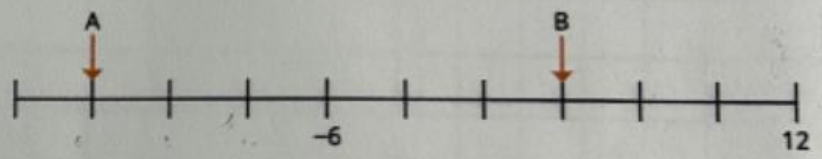
The winner is the person with the highest total.



Who has won the game and by how many points?

Eva has won by 8 points ✓

Here is a number line.



a) Work out the values of A and B.

A = -15 ✓ B = 3 ✓

b) Complete the calculations.

-12 ✓ -18 ✓

Calculation Policy

This document guides you through the **appropriate calculation methods within each year group** and the **progression** of skills **throughout the school**.

The content of this document is set out in year group blocks under the following headings: **addition, subtraction, multiplication and division**.

The calculation policy can be found on the school website.

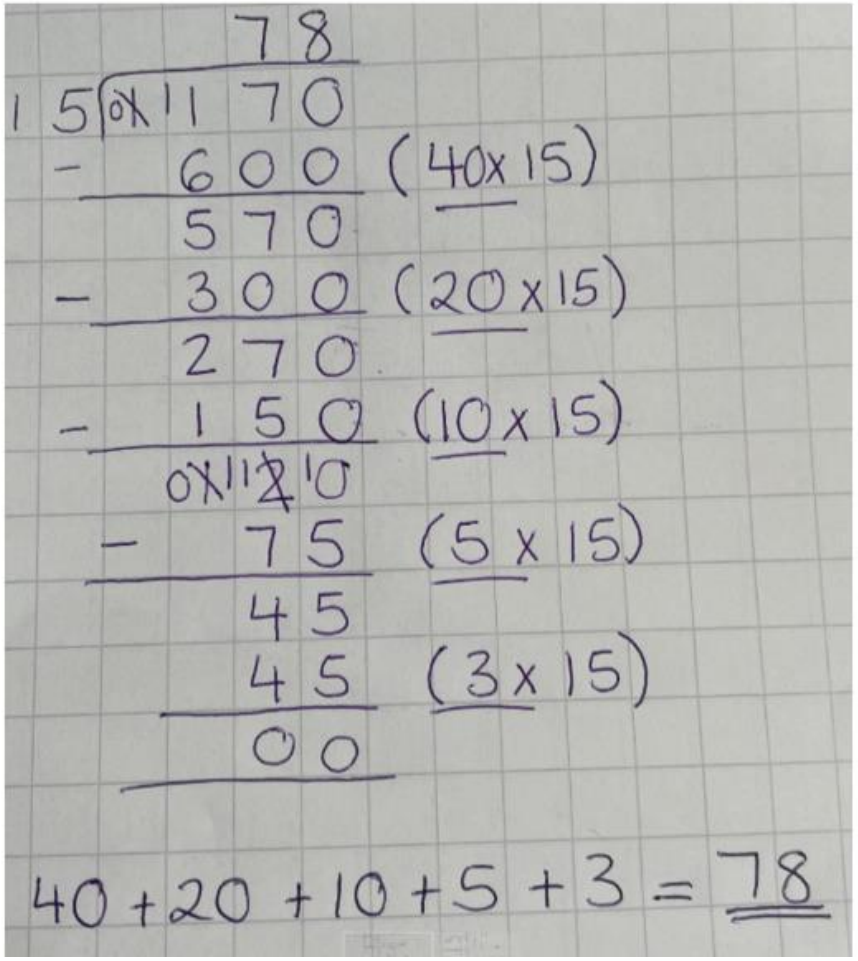
Calculation Policy for 'Long Division'

One method to pay particular attention to.

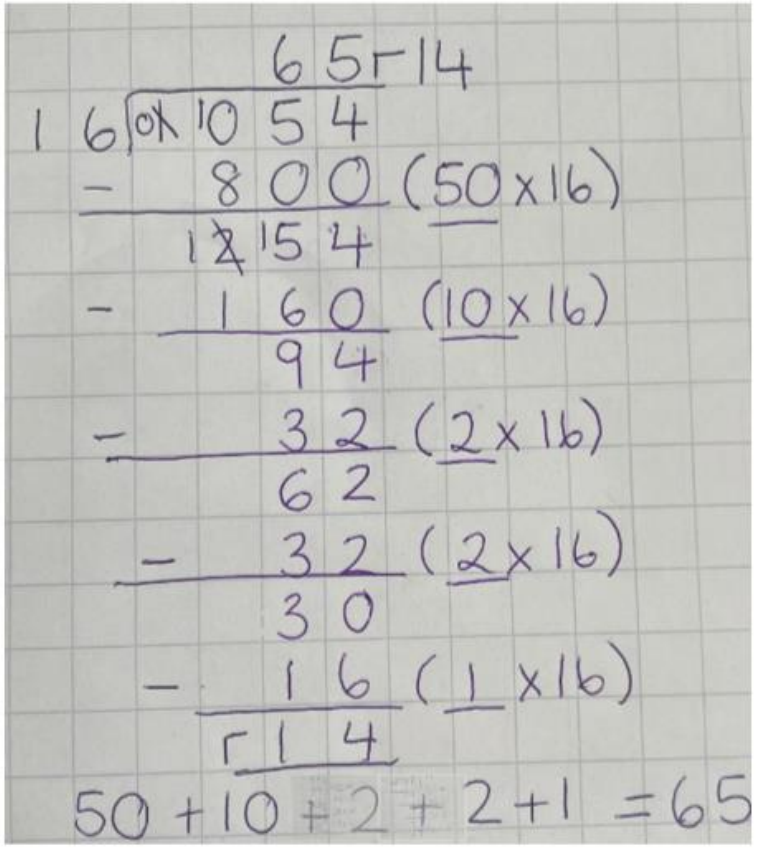
'Long Division' by 'Chunking'(Y6)

Use repeated addition. Children use known facts to take away in 'chunks'. E.g. 10 x, doubling, halving

Without remainders.



With remainders.



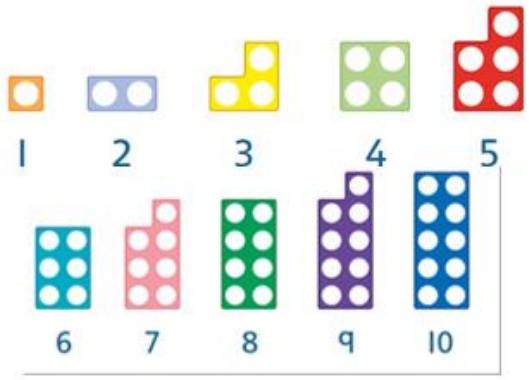
Concrete, Pictorial, Abstract

The concrete, pictorial, abstract approach (or CPA method) is a process of using "concrete" equipment to represent numbers (including fractions) and operations, such as addition, subtraction, division and multiplication, followed by a pictorial representation to represent the equipment or derived structures (like bar and part-whole models), before moving on to the "abstract" digits and various other symbols used in mathematics.

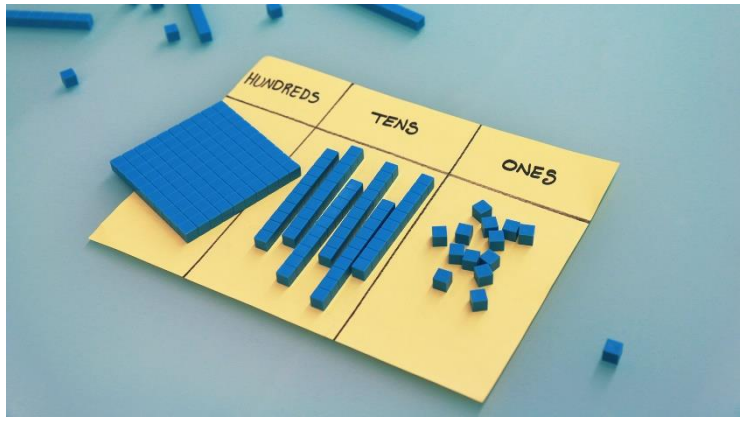
Which concrete resources to we use in Y5/6?

place value counters

dienes



numicon

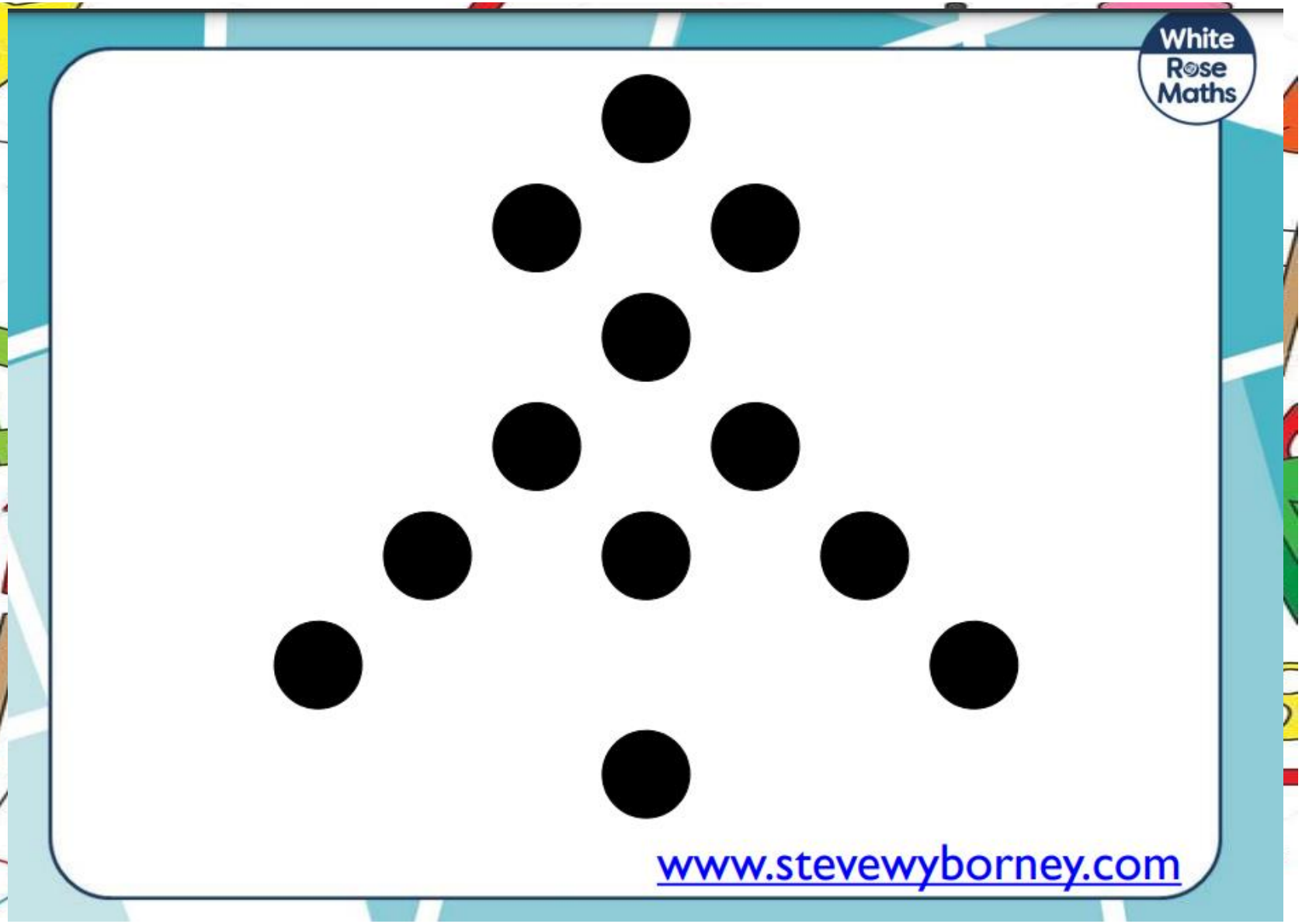


Speak Like a Mathematician

During maths lessons children are encouraged to "SLAM" which means to **Speak Like A Mathematician**. The main reason for this is to improve children's ability to talk and write about maths, therefore developing their overall maths skills. There is also evidence which suggests that rich mathematical talk enables children to develop and use a wide range of mathematical vocabulary accurately, guides children towards a deeper understanding of mathematical structures, supports with understanding and remembering key facts, increases confidence and is beneficial for children who are new to learning English.

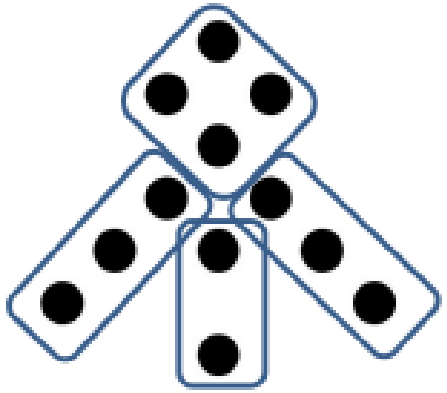
Activities which may support rich mathematical talk...

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

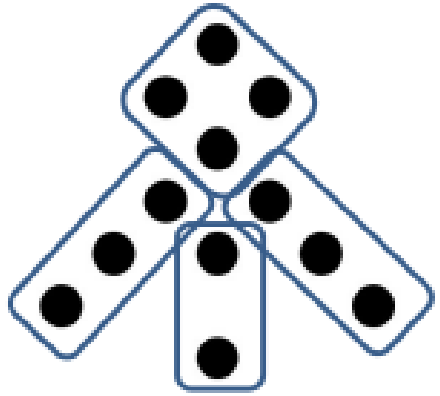


Number Talks

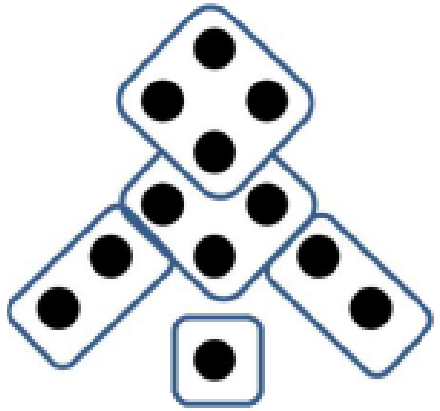
How many ways …?



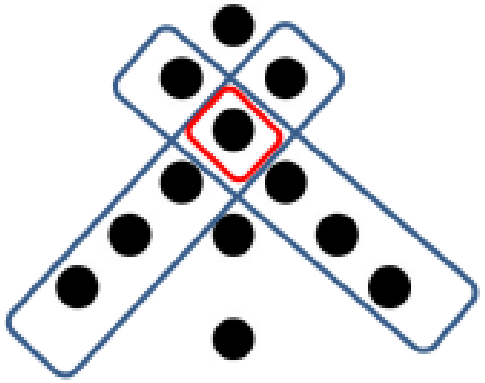
$4 + 3 + 3 + 2 = 12$



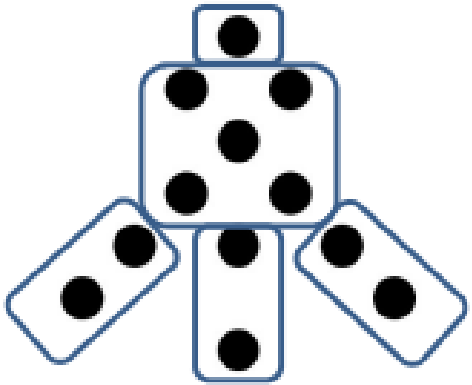
$4 + 3 + 2 + 3 = 12$



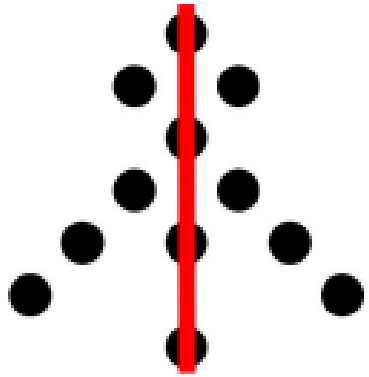
$4 + 3 + 2 + 2 + 1 = 12$



$5 + 5 + 3 - 1 = 12$



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



$6 + 6 = 12$

Good questions, and equally important, good listening can help children make sense of mathematics, build their confidence, and encourage mathematical thinking and communication. A good question opens up a problem and supports different ways of thinking about it. Some questions to try while helping a child might include:

- What do you already know about this?
- What do you need to find out?
- How might you begin?
- How can you organise your information?
- Can you draw a picture to explain your thinking?
- Are there other possibilities?
- What would happen if ...?
- What do you need to do next?

How can you support your child at home?

- Take away their fear and reassure and praise whenever possible
- Refer to the calculation policy (this can be found on the website) if you are unsure of the calculation method your child will use in school
- Use maths in everyday routines at home and involve children in this process e.g. portioning meals, cutting vegetables into halves, quarters etc.
- Encourage games that use shapes and numbers
- Recognise the importance of maths in everyday life e.g. telling the time and managing money

Ideas for everyday maths opportunities...

When watching T.V – look at the guide and work out the length of time until the next programme

Look at food packaging and recognise different 2D/3D shape properties

Practise telling the time in different formats – can they tell the time in digital and analogue?

Playing games together – bingo, monopoly, snakes and ladders, card games, connect four, battle ships

Pattern spotting- look at door numbers whilst walking to school. Are these odd or even? Is there a pattern?

Cooking/baking – weighing out ingredients, portioning, calculating cooking time

Shopping – can children work out total costs? Can they calculate the change needed? Can they add the coins up if using cash?

Websites to Support Children's Maths Learning at Home:

Maths Zone - https://mathszone.co.uk/
BBC Bitesize - https://www.bbc.co.uk/bitesize/subjects/z826n39
I See Maths - https://www.iseemaths.com/games-resources/
Hit the Button - https://www.topmarks.co.uk/maths-games/hit-the-button

Times Table Rockstars (TTRS)

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.

Times Table Rockstars (TTRS)

Every child in KS2 has a TTRS account. There are a number of different games children can play on the website.

Thank you for taking the time to attend the workshop today. If you have any questions, please feel free to stay and ask a member of staff.