Welcome to the Year 5 workshop

MATHEMATICS WORKSHOP

Poulton Lancelyn Primary School

NATIONAL CURRICULUM CHANGES

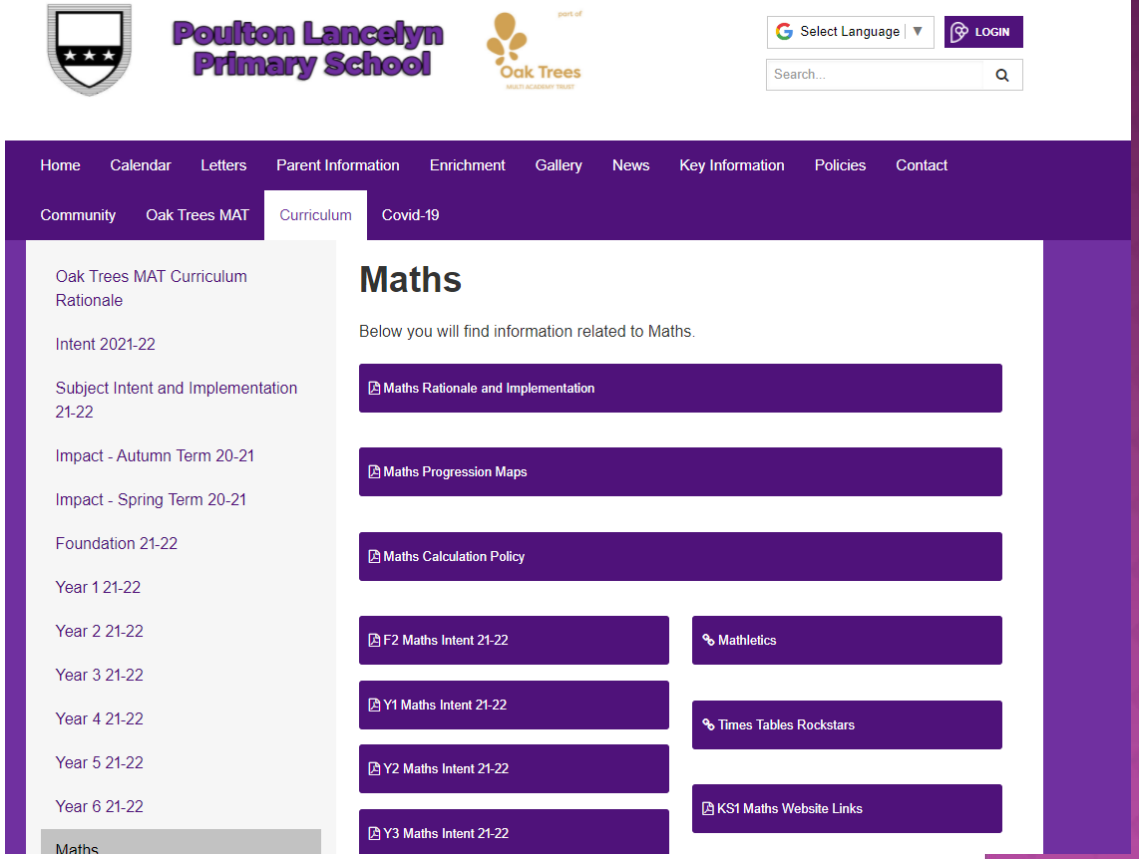
- New Curriculum introduced from September 2014 for all pupils.
- Children must be mathematically fluent.
- Expectations have changed. Coverage and skills have been “pushed down.”
- No longer using levels. Emerging, Expected, exceeding.

SCHOOL CHANGES

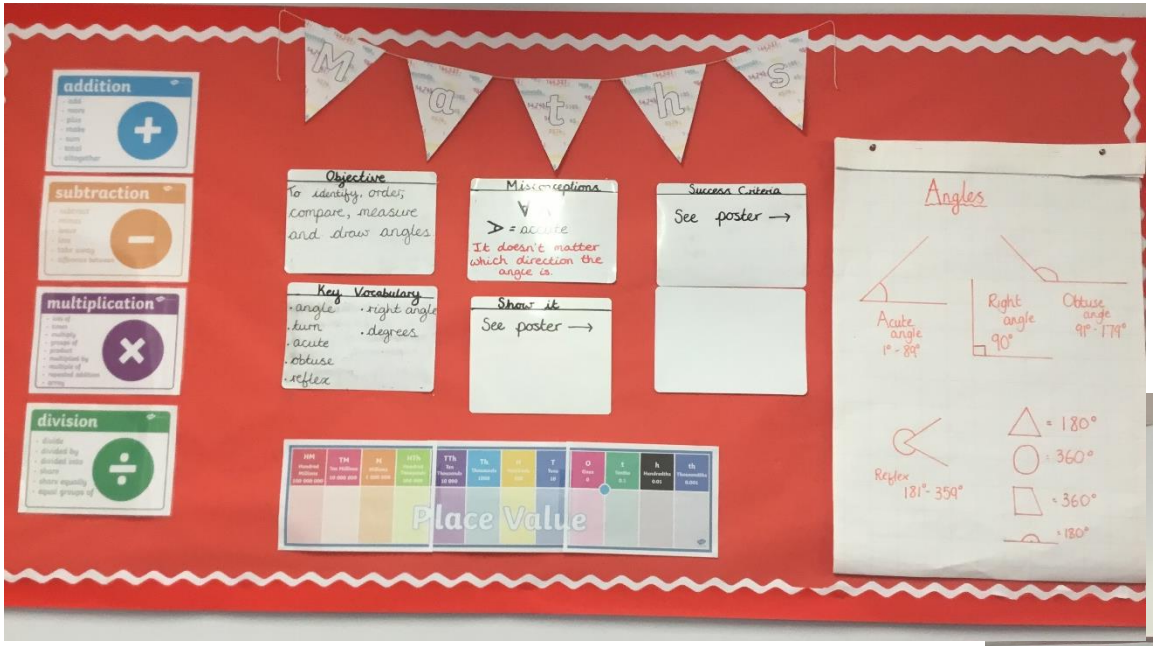
- Maths calculation policy (on the website)
- 2 maths sessions per day – main (45 mins) and fluency (15 mins)
- More focus on number to develop number fluency
- Focus on developing mastery in maths
- Focus for Year 5 on retrieval of knowledge from past year groups and new UKS2 knowledge in preparation for SATs next year

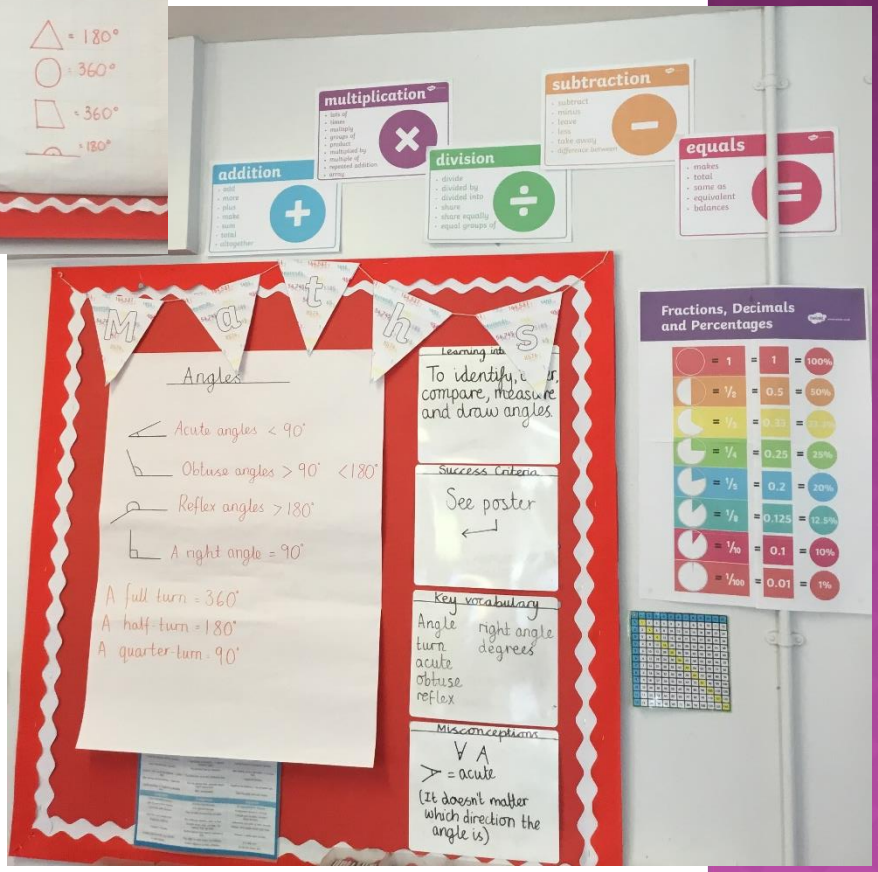
WRITTEN MATHEMATICS

- Detailed breakdown for each year group in calculation policy (on website)
- Summary document highlights key stages
- Mathematics session in each year group will outline the calculation methods used within that group



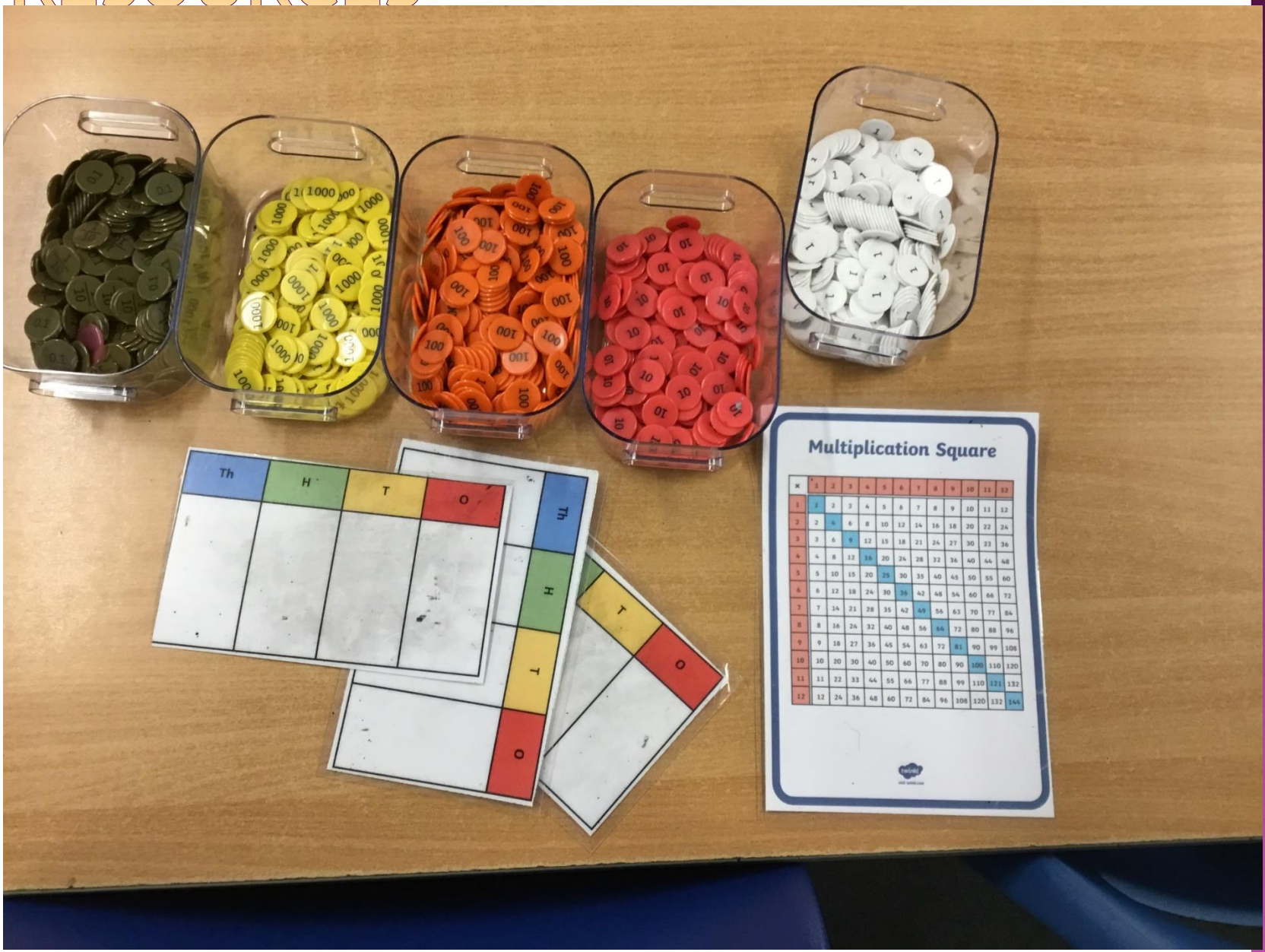
CLASSROOM ENVIRONMENT





Working walls to aid retrieval and support mathematical understanding

RESOURCES



YEAR 5 - LTP (ON SCHOOL WEBSITE)

	W1	W2 - Number	W3 - Operations	W4 - Operation	W5 and 6 - Operation		W7 - Number	Week 8 - Factors and Multiples
A1	2 day week – times table assessment	Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 Read, write, order and compare numbers with up to three decimal places	Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) Add and subtract numbers mentally with increasingly large numbers eg 5-digit – 4-digit multiple of 10	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 Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 Multiply and divide numbers mentally drawing upon known facts	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 Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 Multiply and divide numbers mentally drawing upon known facts		Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 Round decimals with two decimal places to the nearest whole number and to one decimal place	Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers Establish whether a number up to 100 is prime and recall prime numbers up to 19 Recognise and use square numbers and cube numbers, and the notation for squared and cubed
	W1 - Operation	W2 - Fractions	W3 - Fractions	W4 - Number	W5 - Number	W6 – Statistics	W7 - Geometry	
A2	Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy Solve problems involving number up to three decimal places 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 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	Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths Compare and order fractions whose denominators are all multiples of the same number (less than one)	Add and subtract fractions with the same denominator and denominators that are multiples of the same number	Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero	Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	Solve comparison, sum and difference problems using information presented in a line graph (and bar charts)	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.	
	W1 - Fractions	W2 - Fractions	W3 - Measure	W4 - Operations	W5 - Fractions	W6 - Fractions	W7 - Geometry	
Sp1	Recognise mixed numbers and improper fractions and convert from one form to the other and write	Multiply proper fractions and mixed numbers by whole numbers, supported	Solve problems involving converting between units of time	Solve addition and subtraction multi-step problems in contexts, deciding which operations	Recognise the per cent symbol (%) and understand that per cent relates to	Solve problems which require knowing percentage and	Identify 3-D shapes, including cubes and other cuboids, from 2-D representations	

HOME HELP

- Technology (Mathletics)
- Times tables (TT Rockstars)
- Real-life support – money and time

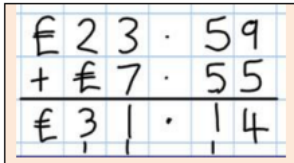
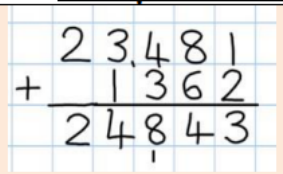
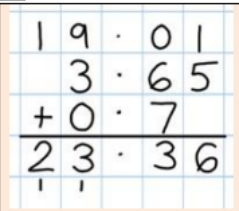
USING AND APPLYING

- We regularly use reasoning and problem solving questions within lessons to allow children to apply their understanding of the four operations. Children are encouraged to explain and prove their understanding verbally and their beginning to record their thought processes.

ADDITION

Year 5 Addition

Steps to success

 The decimal point should be aligned in the same way as the other place value columns, and must be in the same column in the answer.	 Numbers should exceed 4 digits.	 Pupils should be able to add more than two values, carefully aligning place value columns. Empty decimal places can be filled with zero to show the place value in each column. Say "6 tenths add 7 tenths" to reinforce place value.

Key Skills

- Add numbers mentally with increasingly large numbers, using and practising a range of mental strategies ie. add the nearest multiple of 10, 100, 100 and adjust; use near doubles, inverse, partitioning and re-combining; using number bonds.
- Use rounding to check answers and accuracy.
- Solve multi-step problems in contexts, deciding which operations and methods to use and why.
- Read, write, order and compare numbers to at least 1 million and determine the value of each digit.
- Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.
- Add numbers with more than 4 digits using formal written method of columnar addition

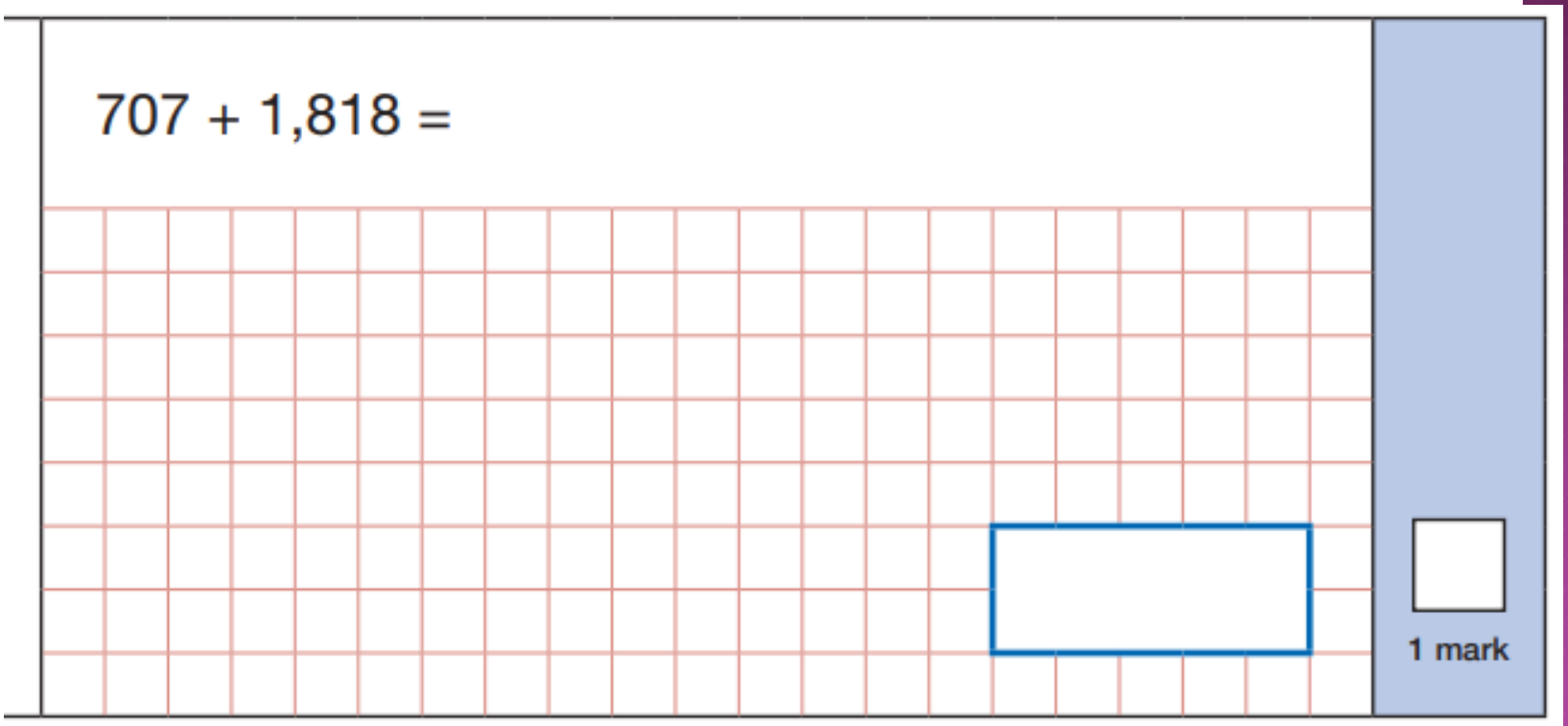
Key vocabulary:

decimal places, decimal point, tenths, hundredths, thousandths

We will now demonstrate the addition method

ADDITION

- Here is how we would solve…



ADDITION

- Now you try…

Dexter is playing a computer game.

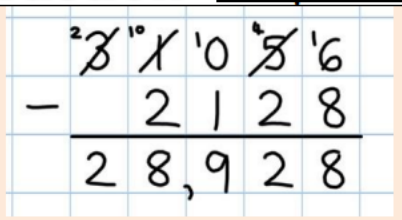
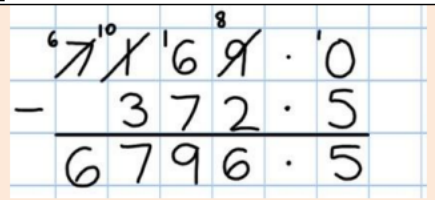
The table shows the number of points he gets in each round.

Round	1	2	3
Number of points	3,550	2,175	1,895

a) How many points does Dexter have at the end of Round 2?

SUBTRACTION

Year 5 Subtraction Steps to success

Year 5		
Add and subtract numbers mentally with increasingly large numbers eg 5-digit – 4-digit multiple of 10 Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	 Children who are still not secure with number facts and place value will need to remain on the partitioned column method until ready for the compact method.	 Subtract with decimal values, including mixtures of integers and decimals, aligning the decimal point Add a 'zero' in any empty decimal places to aid understanding of what to subtract in that column.

Key Skills

- Subtract numbers mentally with increasingly large numbers .
- Use rounding and estimation to check answers to calculations and determine, in a range of contexts, levels of accuracy .
- Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why.
- Read, write, order and compare numbers to at least 1 million and determine the value of each digit.
- Count forwards or backwards in steps of powers of 10 for any given number up to 1 million.
- Interpret negative numbers in context, counting forwards and backwards with positive and negative integers through 0.
- Round any number up to 1 million to the nearest 10, 100, 1000, 10 000 and 100 000.

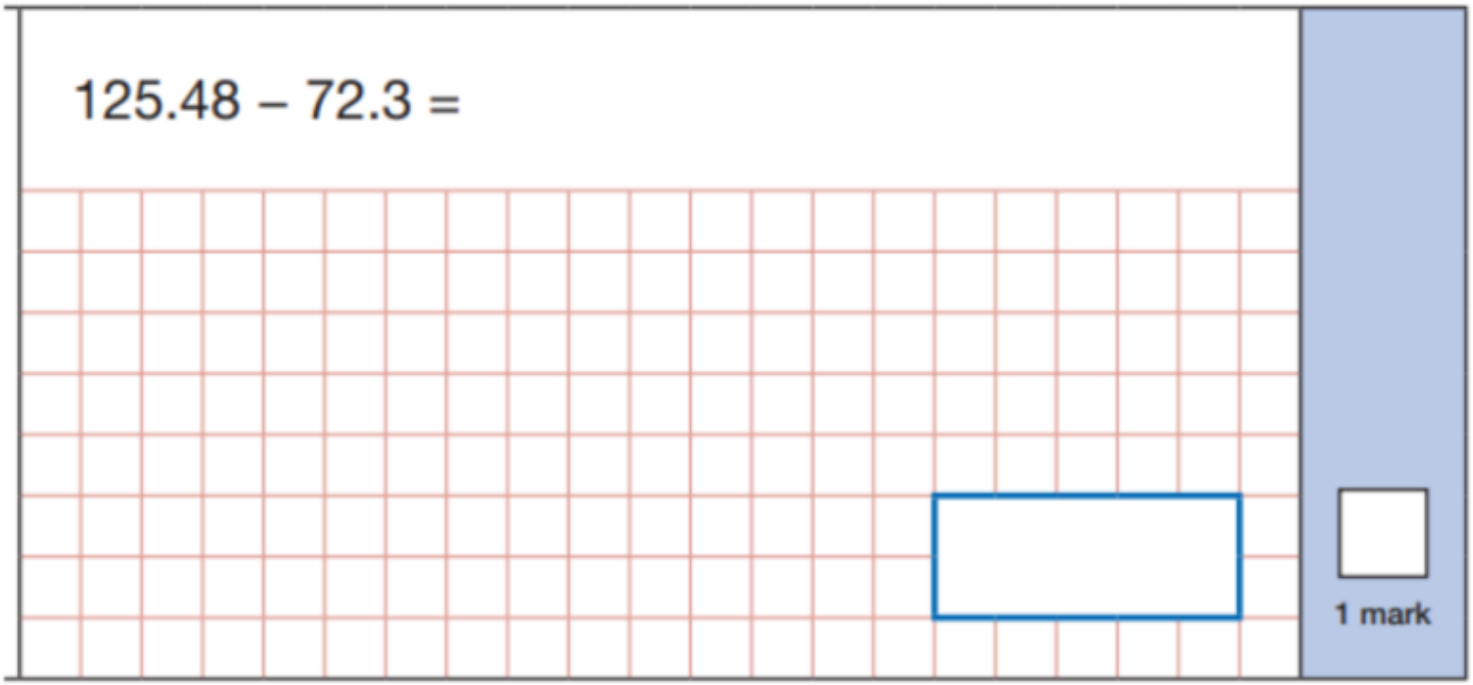
Key vocabulary:

tenths,
hundredths,
decimal point,
decimal

We will now demonstrate our subtraction method

SUBTRACTION

- Here's how we would solve…



SUBTRACTION

- Now you try…

Amir's car costs £1,749

Whitney's car costs £2,300

What is the difference between the cost of the two cars?

£ _____

MULTIPLICATION

Year 5 Multiplication

Steps to success

Year 5	Multiply and divide numbers mentally drawing upon known facts multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	**Mental calculation** **Partitioning** **407 × 4** **400 × 4 = 1600** **0 × 4 = 0** **7 × 4 = 28** **1600 + 28 = 1628** **Rounding and adjusting** **£3.99 × 6** **£4 × 6 = £24** **£24.00 – £0.06 = £23.94** **28 × 19** **28 × 10 × 2 = 560** **560 – 28 = 532**	**Short multiplication for multiplying by a single digit** H T U 3 2 7 × 4 1 3 0 8 1 2 Introduce by comparing a grid method calculation to a short multiplication method, to see how the steps are related, but notice how there are less steps involved in the column method. Children need to be taught to approximate first, e.g. for **72 x 38, they will use rounding: 72 x 38** is approximately 70 x 40 = **2800**, and use the approximation to check the reasonableness of their answer against.	**Introduce long multiplication for multiplying by 2 digits** Use the grid to introduce long multiplication as the relationship can be seen in the answer in each row 18 x 3 on the 1st row (8 x 3 = 24, carrying the 2 for twenty, then '1' x 3). 18 x 10 on the 2nd row. Put a zero in units first, then say 8 x 1, and 1 x 1

×	300	20	7
4	1200	80	28

	10	8
10	100	80
3	30	24

		1	8
	×	1	3
		5	4
	1	8	0
	2	3	4

Key Skills

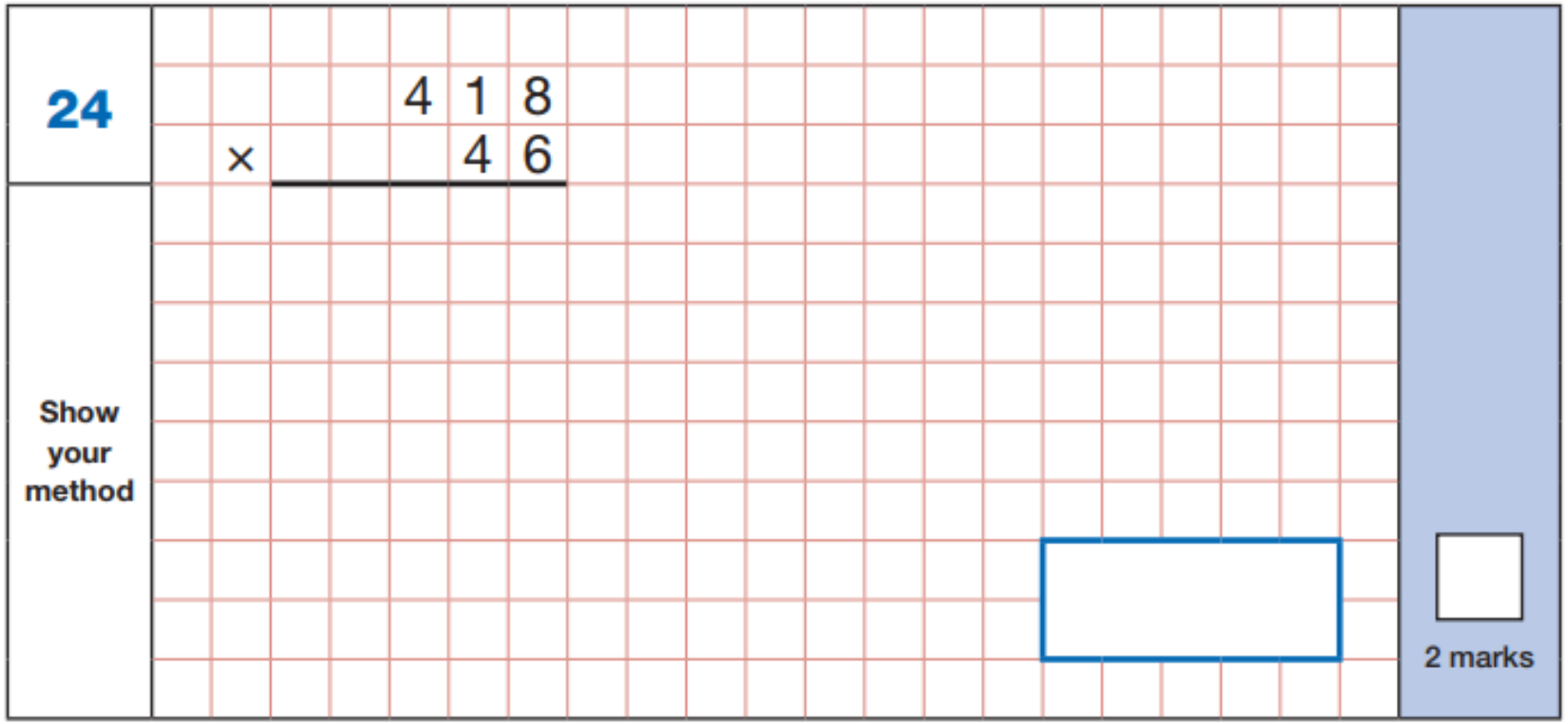
Identify multiples and factors, using knowledge of **multiplication tables to 12x12.**
Solve problems where larger numbers are decomposed into their factors
Multiply and divide integers and decimals by 10, 100 and 1000
Recognise and use square and cube numbers and their notation
Solve problems involving combinations of operations, choosing and using calculations and methods appropriately.
Video clips: **Moving from grid method to a compact method (youtube)**

Key vocabulary:
square, factor, integer, decimal, short/long multiplication, 'carry'

We will now demonstrate our multiplication method

MULTIPLICATION

- In year five we introduce long multiplication…



MULTIPLICATION

- Now you try…

In a theatre there are 45 rows of chairs.

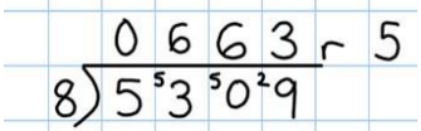
There are 36 chairs in each row.

How many chairs are there altogether?

_____ chairs

DIVISION

Year 5 Division Steps to success

Year 5 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	multiply and divide numbers mentally drawing upon known facts Divide numbers by 10 and 100 H T U 1/10 1/100 2 7 2 7	**Division as grouping drawing on known facts** Use partitioning and known facts 196 ÷ 6 = 32r4 180 (6 x 30) 16 (6 × 2 + 4) 325 ÷ 3= 108r1 300 (3 × 100) 25 (3 × 8 + 1)	**Divide up to 4 digits by a single digit,** including those with remainders.  **Short division with remainders:** Now that pupils are introduced to examples that give rise to remainder answers, division needs to have a real life problem solving context, where **pupils consider the meaning of the remainder and how to express it,** ie. as a fraction, a decimal, or as a rounded number or value , depending upon the context of the problem The answer to 5309 ÷ 8 could be expressed as 663 and five eighths, 663 r 5, as a decimal, or rounded as appropriate to the problem involved.

Key Skills

- Recall multiplication and division facts for all numbers up to 12 x 12 (as in Y4).
- Multiply and divide numbers mentally, drawing upon known facts.
- Identify multiples and factors, including finding all factor pairs of a number, and common factors of two number.
- Solve problems involving multiplication and division where larger numbers are decomposed into their factors.
- Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.
- Use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.
- Work out whether a number up to 100 is prime, and recall prime numbers to 19.

- 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
- Use multiplication and division as inverses.
- Interpret non-integer answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding (e.g. 98 ÷ 4 = 24 r 2 = $24\frac{1}{2}$ = 24.5 ≈ 25).
- Solve problems involving combinations of all four operations, including understanding of the equals sign, and including division for scaling by different fractions and problems involving simple rates.

Key vocabulary:
quotient, prime number, prime factors, composite number (non-prime)

We will now demonstrate our division method

DIVISION

- We use the bus stop method to divide in year five.

DIVISION

- Now you try…

Jack is thinking of a number.

When he multiplies his number by 7, he gets 161

What is Jack's number?

_____