

The background features abstract, overlapping green geometric shapes, primarily triangles and polygons, in various shades of green, creating a modern and dynamic design.

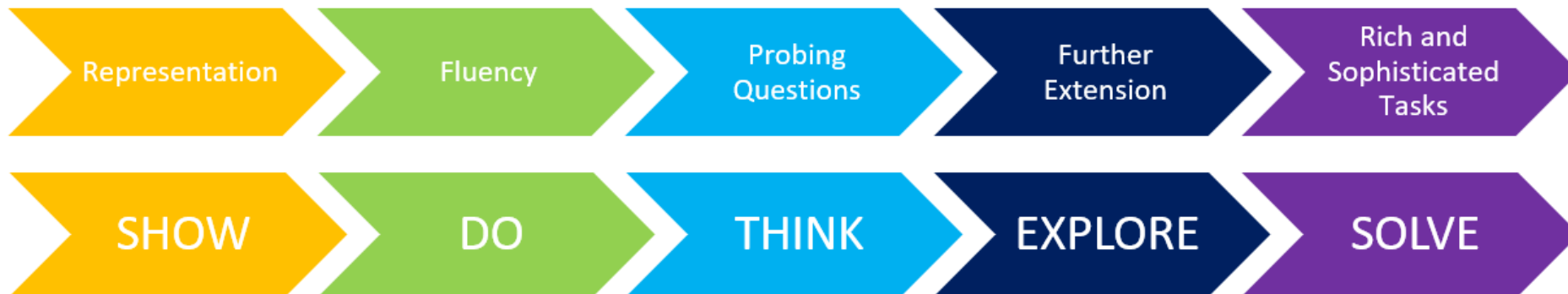
Maths Parent Workshop Year 5

Aims of Workshop

- ▶ To understand how maths is taught at Highwood
- ▶ To understand the age related expectations in maths
- ▶ To understand how you can help your children at home
- ▶ To have a better understanding of the maths language used in teaching maths

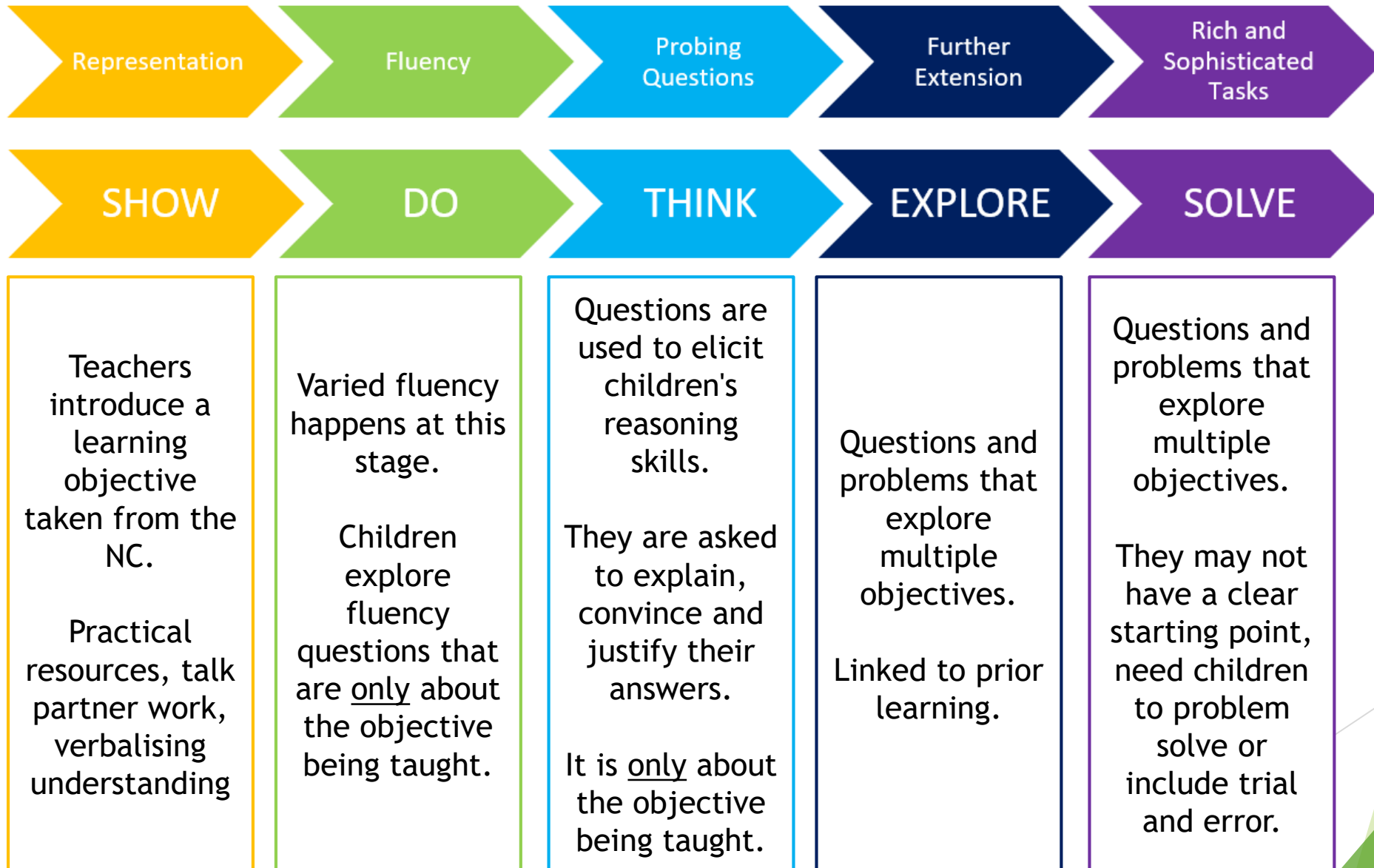
How is maths taught at Highwood?

- ▶ We follow White Rose Hub to help us plan our small steps and use a mastery flow within our lessons
- ▶ The process encourages pupils to become fluent in the fundamentals of maths through frequent practice with increasing complexity over time



- ▶ Children move through the mastery flow process at their own pace. Some children might be on do while others have moved through the other stages and are now on solve.
- ▶ Adults support children, identifying misconceptions and addressing them throughout the lesson
- ▶ We build children who are not only inquisitive learners, but resilient problem solvers, who have the confidence to try and try again. They are confident mathematical communicators who can explain, justify and reason

What happens at each stage of the flow?



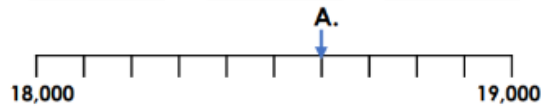
Show

Do

DO

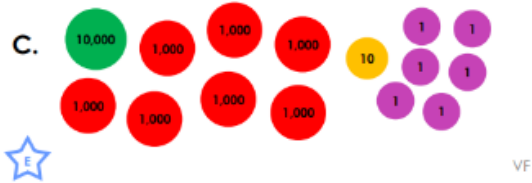
5a. Match the representation to the correct number.

10,800 17,016 18,600



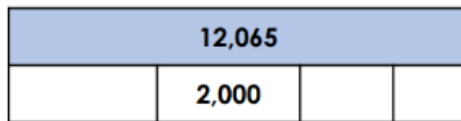
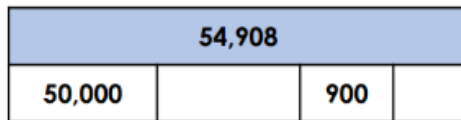
B.

TTh	Th	H	T	O
•		•••••		



DO

1. Complete the bar models.



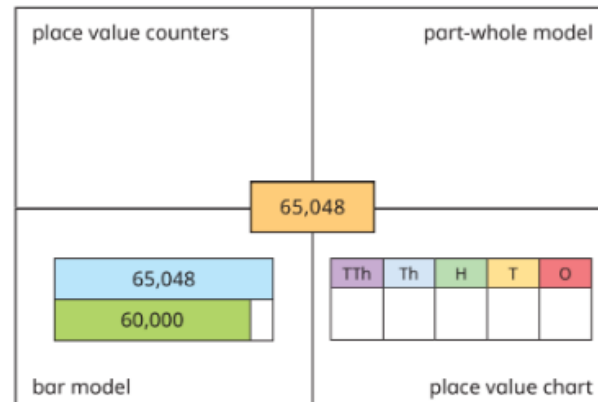
DO

What number is shown on the place value chart?

TTh	Th	H	T	O
10,000 10,000 10,000 10,000	1,000	100 100 100	10 10	1 1

DO

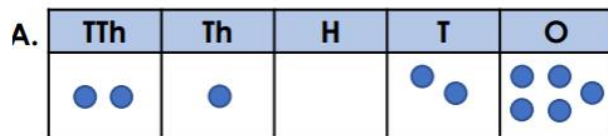
Complete the grid to show the number in different ways.



Think

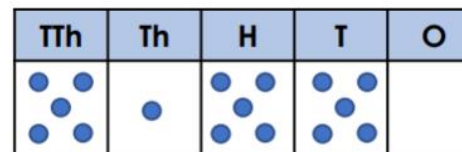
THINK

5a. Find the odd one out in the representations below.



THINK

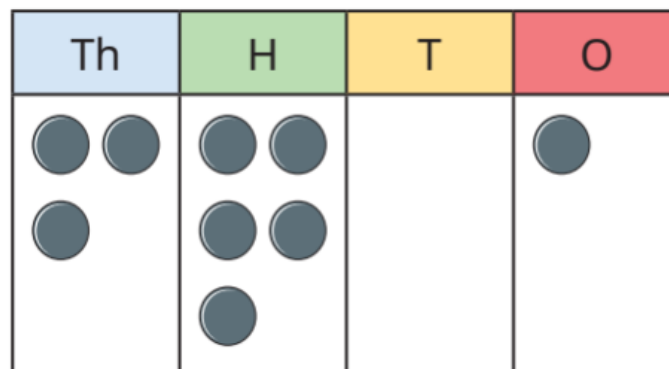
5. Gia is placing numbers represented in a place value chart on a number line.



Is she correct?
Explain how you know.

THINK

Miss Majer thinks the number shown below is 351. Is she correct?
Explain how you know.



Explore

EXPLORE

7a. Jasmine is thinking of a five-digit number.

- She adds XXX to it.
- She subtracts CC from it.
- She subtracts VI from it.

Her answer is:

twenty-seven thousand,
two hundred and eight

What was her original number?
Give your answer in words.

EXPLORE

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.

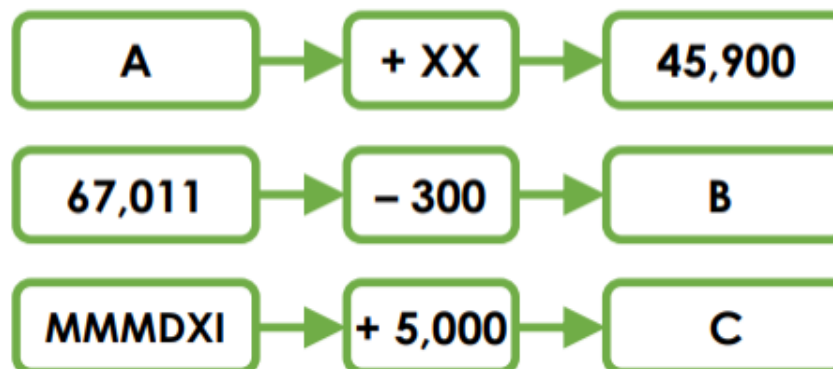
AABCD
ACDCB
DCABA
CDADC
BDAAB

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.

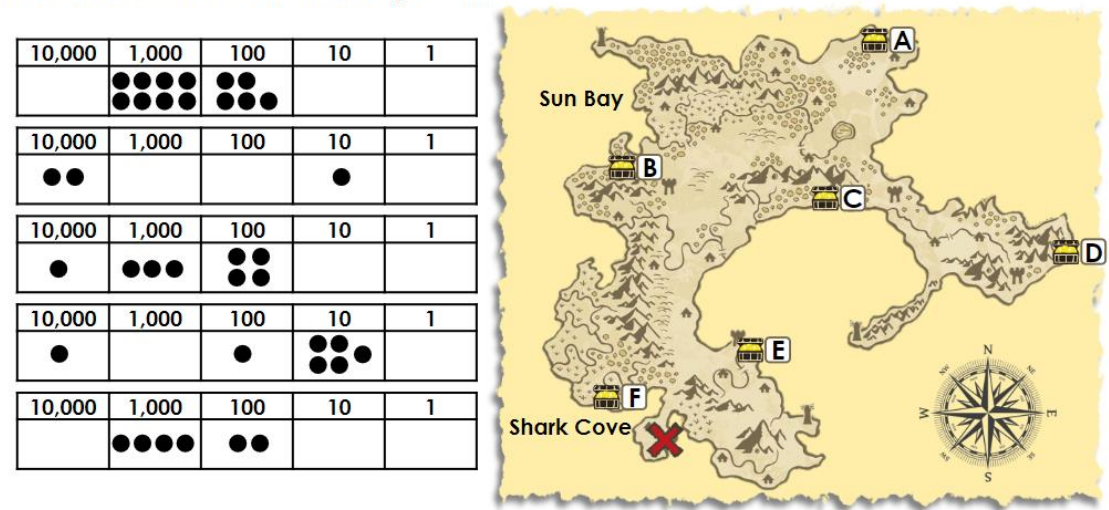
EXPLORE

10a. Find the missing numbers in the function machines below.



Solve

1. No Beard has hidden some treasure on the island. She has recorded the number of steps taken to reach each piece of treasure on the place value charts below to help her find them again. Starting from her landing point (marked with a cross), which piece of treasure could each chart represent?



One treasure chest doesn't have a grid. Complete the place grid to represent it.

10,000	1,000	100	10	1

2. Tina is playing a game against Robo where they have to place digit cards to make 5-digit numbers. Explore all the possible ways Tina could win each round using the digits available for both players.



Tina



Robo

Largest even number wins

8 , 5 2 4 2 1 9 6 8 , 8 9

Smallest odd number wins

7 , 3 7 5 9 3 1 1 9 9

Closest to 50,000

3 , 5 2 5 7 6 8 , 5 8 1

Furthest from 45,00

2 , 7 5 1 9 3 4 7 2 6 , 9

Moving through concrete, pictorial and abstract (CPA)

What is the Concrete Pictorial Abstract in Maths?

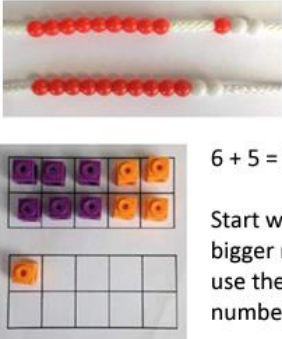
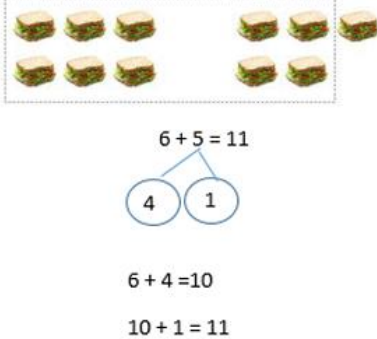
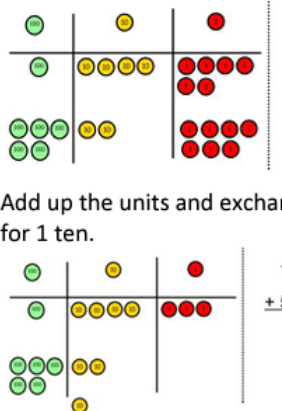
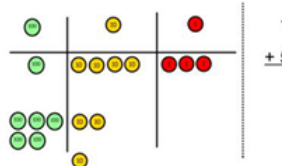
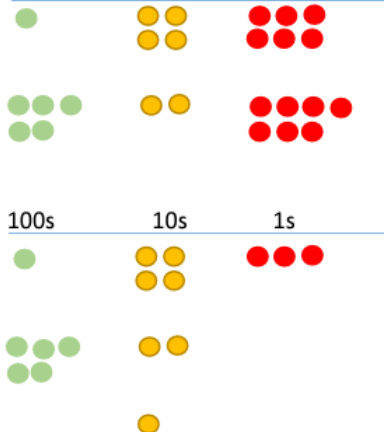
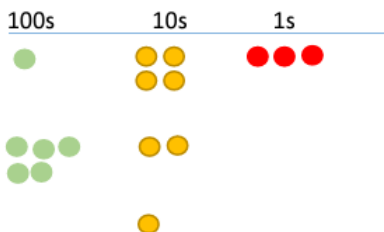
The Concrete Pictorial Abstract (CPA) approach is a system of learning that uses physical and visual aids to build a child's understanding of abstract topics.

Pupils are introduced to a new mathematical concept through the use of concrete resources (e.g. fruit, Dienes blocks etc). When they are comfortable solving problems with physical aids, they are given problems with pictures - usually pictorial representations of the concrete objects they were using.

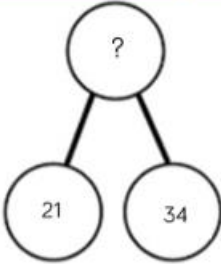
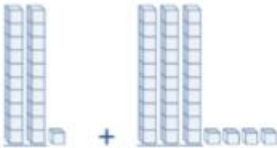
Then they are asked to solve problems where they only have the abstract i.e. numbers or other symbols. Building these steps across a lesson can help pupils better understand the relationship between numbers and the real world, and therefore helps secure their understanding of the mathematical concept they are learning.

We move through these representations as part of the show section of teaching. Children are then exposed to all three during the do, think, explore and solve.

CPA example - addition

	Objective	Concrete	Pictorial	Abstract
Year 1	Regrouping to make 10	 6 + 5 = 11 Start with the bigger number and use the smaller number to make 10.	 6 + 5 = 11 6 + 4 = 10 10 + 1 = 11	6 + 5 = 11
Year 3/4	Column method with regrouping	Make both numbers on a place value grid.  146 + 527 Add up the units and exchange 10 ones for 1 ten.  146 + 527 As children move on to decimals, money and decimal place value counters can be used to support learning. NB By Year 4 children will progress on to adding four digit numbers.	100s 10s 1s  100s 10s 1s  Children can draw a pictorial representation of the columns and place value counters to further support their learning and understanding. NB Addition of money needs to have £ and p added separately.	100 + 40 + 6 500 + 20 + 7 600 + 70 + 3 = 673 As the children progress, they will move from the expanded to the compacted method. 146 + 527 673 1 As the children move on, introduce decimals with the same number of decimal places and different. Money can be used here.

Variation (conceptual) - what something is and what it isn't

Conceptual variation; different ways to ask children to solve 21 + 34															
 <table border="1" data-bbox="76 832 476 913"><tr><td colspan="2">?</td></tr><tr><td>21</td><td>34</td></tr></table>	?		21	34	Word problems: In year 3, there are 21 children and in year 4, there are 34 children. How many children in total? 21 + 34 = 55. Prove it	$\begin{array}{r} 21 \\ +34 \\ \hline \end{array}$ 21 + 34 = = 21 + 34 Calculate the sum of twenty-one and thirty-four.	 Missing digit problems: <table border="1" data-bbox="1538 809 1826 1019"><thead><tr><th>10s</th><th>1s</th></tr></thead><tbody><tr><td></td><td></td></tr><tr><td></td><td>?</td></tr><tr><td>?</td><td>5</td></tr></tbody></table>	10s	1s				?	?	5
?															
21	34														
10s	1s														
	?														
?	5														

Maths – End of Year 5 Expectations	
New National Curriculum Objectives	
Number and Place Value	interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero
	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 to at least 1 000 000 and determine the value of each digit
	read Roman numerals to 1 000 (M) and recognise years written in Roman numerals.
	round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000
	round decimals with two decimal places to the nearest whole number and to one decimal place
Addition and Subtraction	solve number problems and practical problems that involve all of the above
	add and subtract numbers mentally with increasingly large numbers
	add and subtract whole numbers with more than 4 digits, including using formal written methods
	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
Multiplication and Division	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
	multiply and divide numbers mentally drawing upon known facts
	multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
	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 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 (nonprime) 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
	solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
	solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
	solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates
	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
Fractions	compare and order fractions whose denominators are all multiples of the same number
	read, write, order and compare numbers with up to three decimal places
	round decimals with two decimal places to the nearest whole number and to one decimal place
	add and subtract fractions with the same denominator and multiples of the same number
	recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements
Decimals / Percentages	identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
	read and write decimal numbers as fractions (e.g. $0.71 = \frac{71}{100}$)
	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
	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 as a decimal fraction
	multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
	solve problems involving numbers up to three decimal places
Algebra	solve problems which require knowing percentage and decimal equivalence
	use the properties of rectangles to deduce related facts and find missing lengths and angles

What is my child taught? What are the age related expectations?

Measurement and Time	calculate and compare the area of squares and rectangles including using standard units and estimate the area of irregular shapes
	estimate volume (e.g. using 1 cm blocks to build cubes and cuboids) and capacity (e.g. using water)
	use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling.
	measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres
	calculate and compare the area of squares and rectangles including using standard units
	solve problems involving converting between units of time
	convert between different units of metric measure
	solve problems involving converting between units of time
	understand and use equivalences between metric units and common imperial units such as inches, pounds and pints
	identify 3-D shapes, including cubes and other cuboids, from 2-D representations
Geometry Shape and Position	draw given angles, and measure them in degrees
	use the properties of rectangles to deduce related facts and find missing lengths and angles
	distinguish between regular and irregular polygons based on reasoning about equal sides and angles
	know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
	Identify angles at a point and on a straight line
Statistics	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
	complete, read and interpret information in tables, including timetables
Statistics	solve comparison, sum and difference problems using information presented in a line graph

http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=2ahUKEwjU1sqGwvLAhWytXEKHZX0A0EQFjAAegQIAhAI&url=http%3A%2F%2Fwww.kingsleycp.cheshire.sch.uk%2Fserve_file%2F88376&usg=AOvVaw3w8t34M4rwr10Uet78C1zb

Stage 5 PROMPT sheet

1 Place value in numbers to 1million

The position of the digit gives its size

Millions	Hundred thousands	Ten thousands	thousands	hundreds	tens	ones
1	2	3	4	5	6	7

Example

The value of the digit '1' is 1 000 000

The value of the digit '2' is 200 000

The value of the digit '3' is 30 000

The value of the digit '4' is 4000

2 Round numbers to nearest 10, 100, 1000, 10000, 100000

Example 1- Round 342 679 to the nearest 10 000

- Step 1 - Find the 'round-off digit' - 4
- Step 2 - Look one digit to the right of 4 - 2

5 or more? NO - leave 'round off digit' unchanged
- Replace following digits with zeros

ANSWER - 340 000

Example 2- Round 453 679 to the nearest 100 000

- Step 1 - Find the 'round-off digit' - 4
- Step 2 - Look one digit to the right - 5

5 or more? YES - add one to 'round off digit'
- Replace following digits with zeros

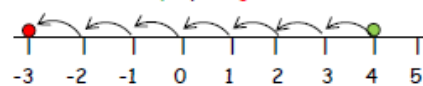
ANSWER - 500 000

3 Negative numbers

A number line is very useful for negative numbers.

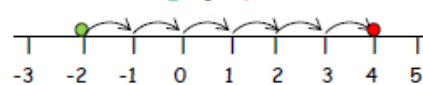
- The number line below shows:

$$4 - 7 = -3$$



- The number line below shows:

$$-2 + 6 = 4$$



4 Roman Numerals

The seven main symbols

I = 1

V = 5

X = 10

L = 50

C = 100

D = 500

M = 1000



Other useful ones include:

IV = 4

IX = 9

XL = 40

XC = 90

5 Written methods for addition

- Line up the digits in the correct columns
- Start from RIGHT to LEFT

$$\begin{array}{r} \text{e.g. } 48 + 284 + 9 \\ \begin{array}{r} \text{H T U} \\ 48 \\ 284 \\ 129 \\ \hline 341 \end{array} \end{array}$$

5 Written methods for subtraction

- Line up the digits in the correct columns
- Start from RIGHT to LEFT

$$\begin{array}{r} \text{e.g. } 645 - 427 \\ \begin{array}{r} \text{H T U} \\ 645 \\ 427 \\ \hline 218 \end{array} \end{array}$$

What is my child taught? What are the age related expectations?

Each year group has a maths booklet for parents. They are emailed at the start of each year and include...

- The strands of maths that are being taught
- Useful maths vocabulary
- The methods that we will be teaching your child

On the website you will also find the curriculum maps which give a summary of what is being taught.

We are also in the process of uploading the White Rose Schemes so you can see examples of what key learning, as well as reasoning and problem solving, might look like

Mental Maths

- ▶ Big focus on mental maths time tables - new approach in school
- ▶ Sessions dedicated to mental arithmetic
- ▶ Building fluency and speed for mental maths papers
- ▶ Continuous recall of the 4 operations

Year 5 10:45 – 11:15am	(5 mins) Timetable booklet for focus times table and marking Use of Sumdog/ TTRS to assess and find key facts 	(5 mins) Timetable booklet for focus times table and marking (20 mins) Teaching around times table focus with number stick/ looking at one fact	<u>French</u>	(5 mins) Timetable booklet for focus times table and marking (25 mins) Arithmetic half paper Mark together Collect misconceptions/ objectives to go through tomorrow	(5 mins) Timetable booklet for focus times table and marking (25 minutes) My mini maths (4 operations) Daily 10/ fast 10 arithmetic Going over misconceptions/ key objectives from arithmetic paper
Year 6 12:00- 12:30pm	(5 mins) Timetable booklet for focus times table and marking (25 minutes) My Mini Maths Mark together and go through misconceptions	(5 mins) Timetable booklet for focus times table and marking Use of Sumdog/ TTRS to assess and find key facts 	<u>French</u>	(5 mins) Timetable booklet for focus times table and marking (25 mins) Arithmetic half paper Mark together Collect misconceptions/ objectives to go through tomorrow	(5 mins) Timetable booklet for focus times table and marking (25 minutes) My mini maths (4 operations) Daily 10/ fast 10 arithmetic Going over misconceptions/ key objectives from arithmetic paper

Mathematical language - place value

Place value is crucial throughout all arenas of the maths curriculum! It is the value of each digit e.g. 582 is made up of 5 hundreds (500) 8 tens (80) and 2 ones (2)

- ▶ Importance of saying ones and not units
- ▶ Decimal points never move
- ▶ Understanding that each value is $\times 10$ more/ less

Place Value

[illegible]

Mathematical language - 4 operations

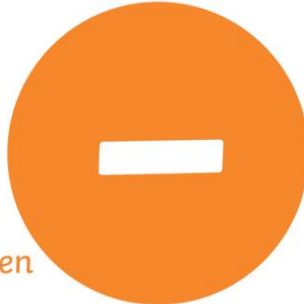
addition

- add
- more
- plus
- sum
- total
- altogether



subtraction

- subtract
- minus
- leave
- less
- take away
- difference between



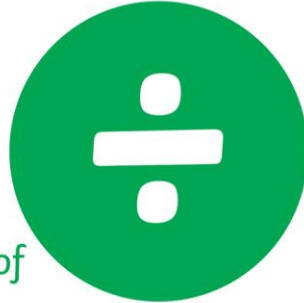
multiplication

- lots of
- times
- multiply
- groups of
- product
- multiplied by
- multiple of
- repeated addition
- array



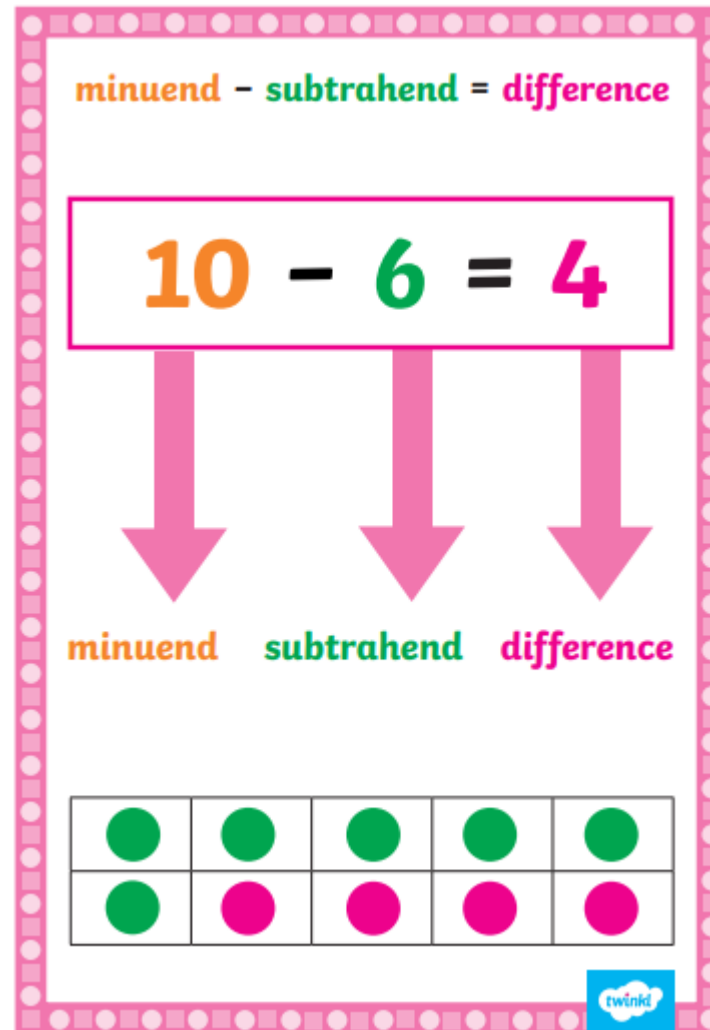
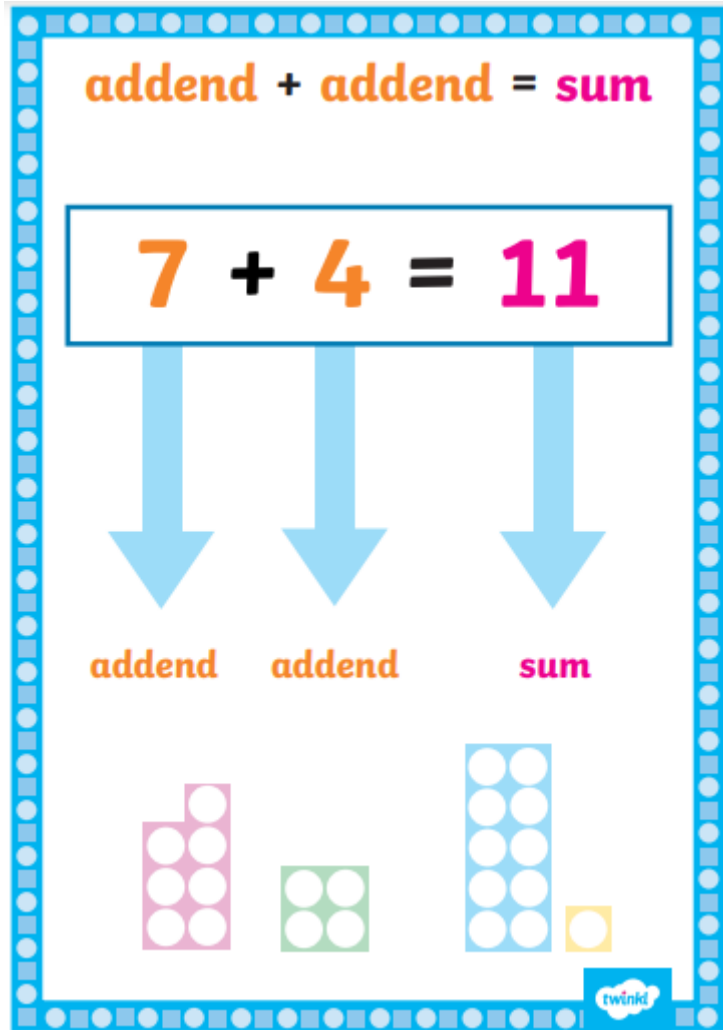
division

- divide
- divided by
- divided into
- share
- share equally
- equal groups of

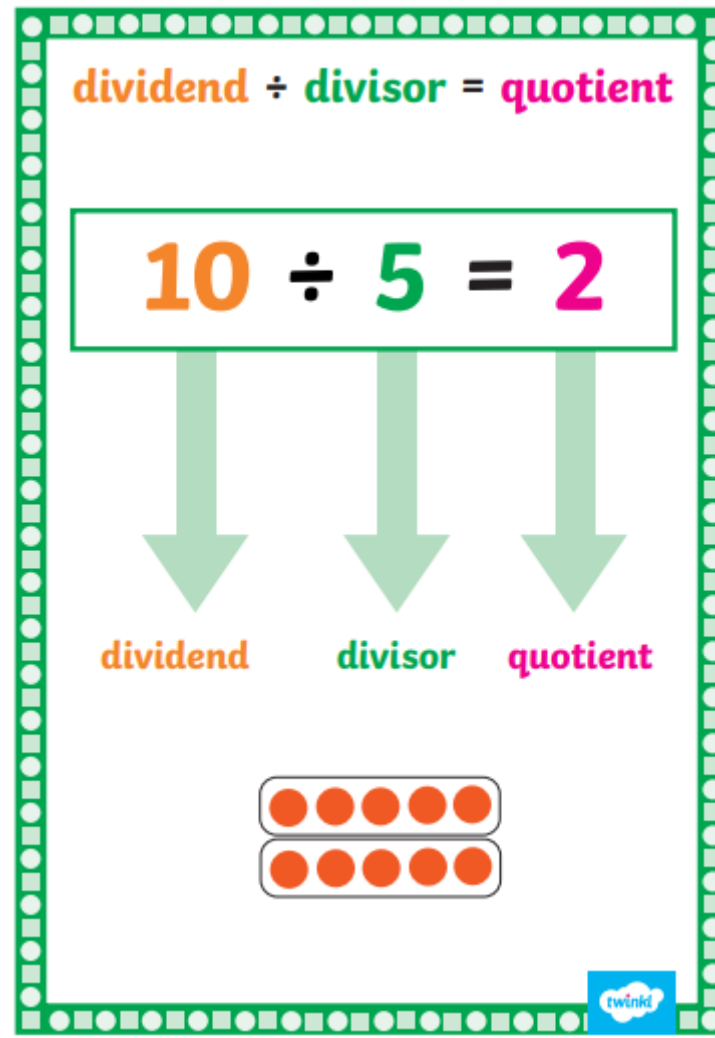
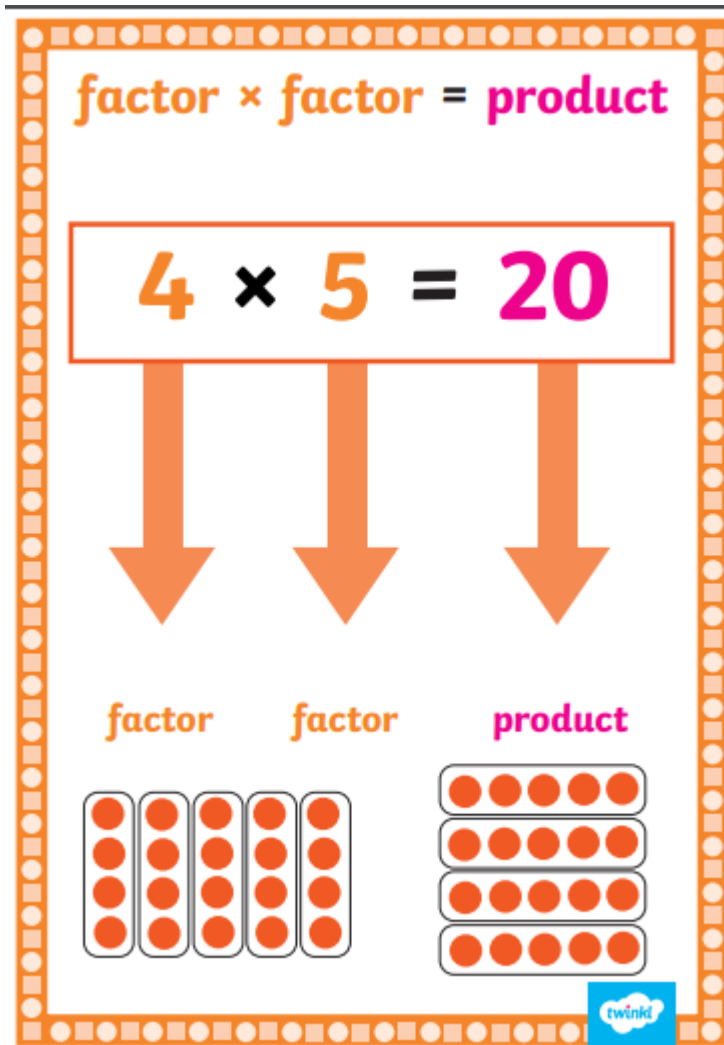


➤ Not using sum for calculation. Sum means add!

Mathematical language



Mathematical language



Sumdog and TTRS



End of Key Stage 2 expectations

Working at the expected standard

The pupil can:

- demonstrate an understanding of place value, including large numbers and decimals (e.g. what is the value of the '7' in 276,541?; find the difference between the largest and smallest whole numbers that can be made from using three digits; $8.09 = 8 + \frac{9}{10}$; $28.13 = 28 + \square + 0.03$)
- calculate mentally, using efficient strategies such as manipulating expressions using commutative and distributive properties to simplify the calculation (e.g. $53 - 82 + 47 = 53 + 47 - 82 = 100 - 82 = 18$; $20 \times 7 \times 5 = 20 \times 5 \times 7 = 100 \times 7 = 700$; $53 \div 7 + 3 \div 7 = (53 + 3) \div 7 = 56 \div 7 = 8$)
- use formal methods to solve multi-step problems (e.g. find the change from £20 for three items that cost £1.24, £7.92 and £2.55; a roll of material is 6m long: how much is left when 5 pieces of 1.15m are cut from the roll?; a bottle of drink is 1.5 litres, how many cups of 175ml can be filled from the bottle, and how much drink is left?)
- recognise the relationship between fractions, decimals and percentages and can express them as equivalent quantities (e.g. one piece of cake that has been cut into 5 equal slices can be expressed as $\frac{1}{5}$ or 0.2 or 20% of the whole cake)
- calculate using fractions, decimals or percentages (e.g. knowing that 7 divided by 21 is the same as $\frac{7}{21}$ and that this is equal to $\frac{1}{3}$; 15% of 60; $1\frac{1}{2} + \frac{3}{4}$; $\frac{7}{9}$ of 108; 0.8×70)
- substitute values into a simple formula to solve problems (e.g. perimeter of a rectangle or area of a triangle)
- calculate with measures (e.g. calculate length of a bus journey given start and end times; convert 0.05km into m and then into cm)
- use mathematical reasoning to find missing angles (e.g. the missing angle in an isosceles triangle when one of the angles is given; the missing angle in a more complex diagram using knowledge about angles at a point and vertically opposite angles).

SATs

You **must not** use a calculator to answer any questions in this test.

Questions and answers

You have **30 minutes** to complete this test.

Work as quickly and as carefully as you can.

Put your answer in the box for each question.

All answers should be given as a single value.

For questions expressed as common fractions or mixed numbers, you give your answers as common fractions or mixed numbers.

If you cannot do a question, go on to the next one.

You can come back to it later, if you have time.

If you finish before the end, **go back and check your work.**

1

$$40 + 1,000 =$$

--	--

1 mark

You **must not** use a calculator to answer any questions in this test.

Questions and answers

You have **40 minutes** to complete this test.

Follow the instructions for each question.

Work as quickly and as carefully as you can.

If you need to do working out, you can use the space around the question.
Do not write over any barcodes.

Some questions have a method box like this:

Show
your
method

For these questions, you may get a mark for showing your method.

If you cannot do a question, go on to the next one.

You can come back to it later, if you have time.

If you finish before the end, go back and check your work.

3

Write the missing numbers to make this **multiplication** grid correct.

2

11

9

63 54

☐

56 48

2

Circle the number that is **10 times** greater than nine hundred and seven.

9,700

907

9,007

970

9,070

1 mark

How to help at home

- ▶ Talk about numbers
- ▶ The four operations in the real world e.g. shopping
- ▶ Using the maths booklets/ information from maths newsletter
- ▶ Importance of learning number bonds/ times tables
- ▶ Using Sumdog/ TTRS
- ▶ Always practice telling the time!

