Mathematics at Kings Furlong Junior School

In delivering the objectives of the 2014 National Curriculum, we aim to:

- Develop learners who are fluent in the fundamentals of mathematics.
- Offer frequent and varied practise in increasingly complex problems over time.
- Support and challenge children in developing the ability to recall and apply knowledge fluently and accurately.
- Ensure that all children can reason mathematically by following lines of enquiries, hypothesising and by communicating their proof effectively.
- Create learners who can apply skills to a variety of contexts with ever increasing sophistication, primarily through breaking problems into a series of smaller steps.

Summary of Pitch

The progression of skills below give a summary of expectations in each year group for the four main calculation functions. These key skills are learnt with the use of resources in order to support greater fluency and understanding. The pupils are also given many opportunities to use these within problem solving contexts.

Year 3

- HTU + U, HTU + T, HTU + H
- HTU - U, HTU - T, HTU - H
- HTU + HTU (wtitten)
- Derive compliments to 100
- Recall and use multiplication and division facts for 3, 4 and 8 times tables
- U x TU
- TU ÷ U (including remainders)

Year 4

- ThHTU + ThHTU
- ThHTU - ThHTU
- Add and subtract decimals with two decimal places in the context of money
- Recall and use multiplication and division facts for tables up to 12 x 12
- Multiply by zero and one
- U x U x U
- U x TU, U x HTU
- TU ÷ U, HTU ÷ U (including remainders)

Year 5

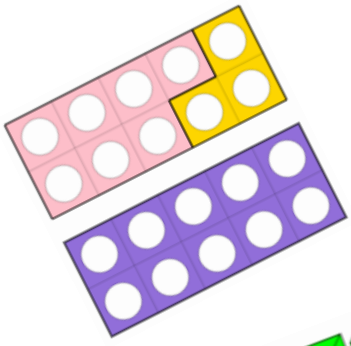
- Mentally + - with increasingly large numbers
- + - numbers with more than four digits
- + - decimals with up to three decimal places
- U x ThHTU, TU x HTU, TU x ThHTU
- Multiply whole numbers with up to three decimal places by 10, 100 and 1000.
- Divide numbers with up to four digits by units (including remainders as fractions, decimals and rounding according to context).

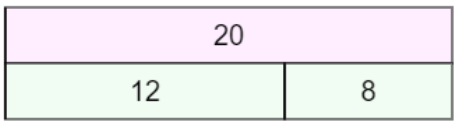
Year 6

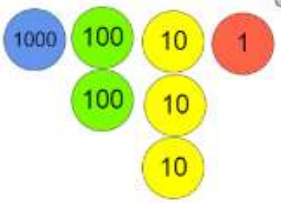
- Multiply one digit numbers with up to 2dp by whole numbers
- Use written division methods in cases where the answer has up to two decimal places
- Use BODMAS to carry out calculations involving the four operations
- Divide numbers up to 4 digits by a 2 digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions or by rounding as appropriate for the context.
- Divide numbers up to 4 digits by a 2 digit number using the formal written method of short division, interpreting remainders according to context

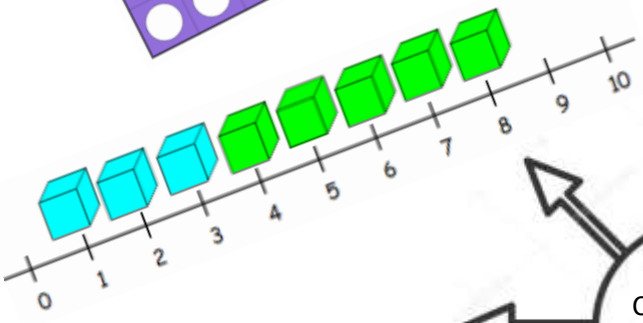
Addition

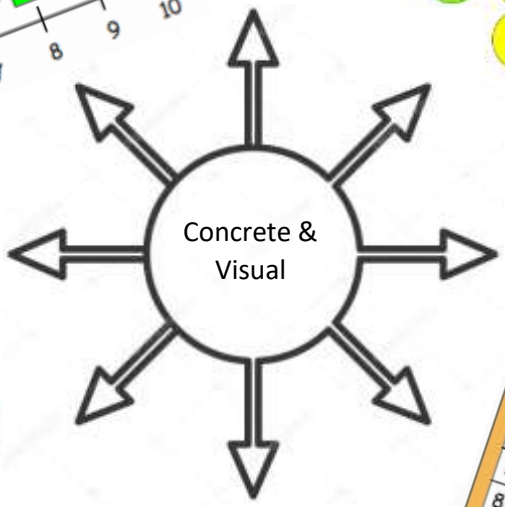
We use the following to help create a greater understanding

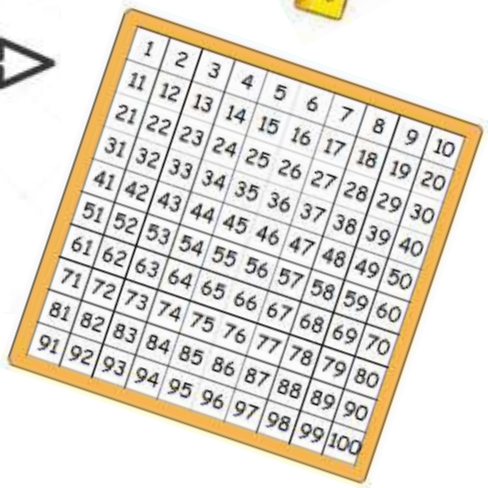


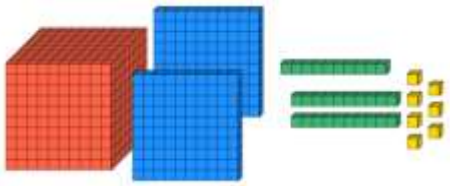


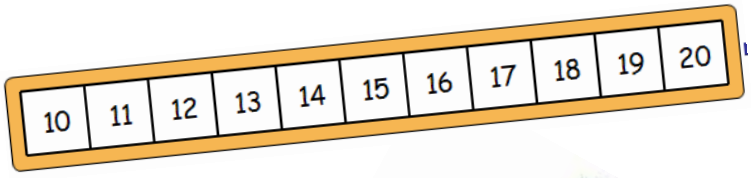


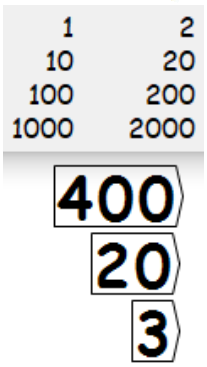


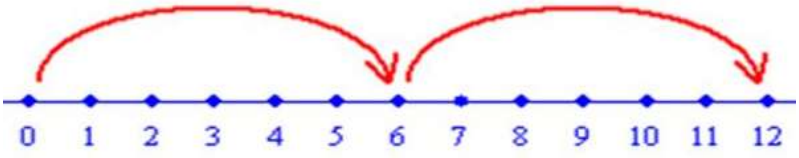












"They help me get the right answer." Ben, Year 3.

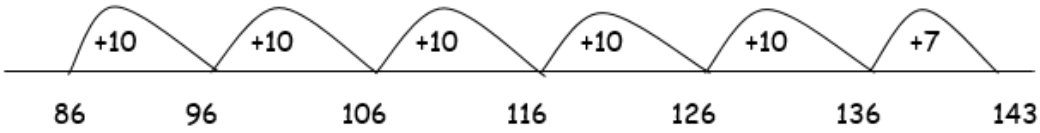
KFJS Strategies

These abstract strategies, seen below, are introduced at different stages once an understanding using concrete and visual resources is in place.

For details of what is expected in each year group, please see the 'Summary of Pitch'.

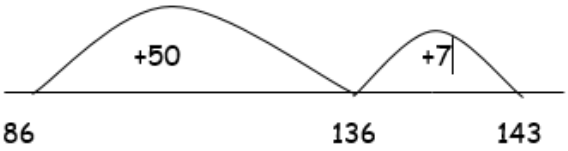
86 + 57 =

Counting up in tens and then units using a number line



So 86 + 57 = 143

Moving towards using the fewest jumps



	8	0		6	
+	5	0		7	
1	3	0	+	13	=143

Remember to teach children to start from the right (good practise for later work)

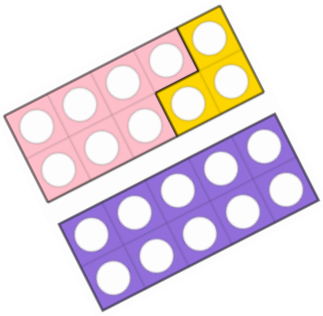
	8	6	
+	5	7	
1	4	3	
~~1~~	~~1~~		

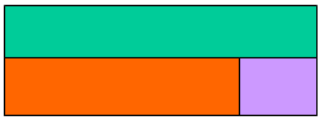
Cross out digits once added with the next column.

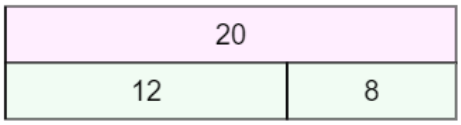
We make use of the following resources to support move children from fluency to reasoning: Target Your Maths, Fluent in 5, White Rose, Problem of the Day, I See Reasoning, Thinking Tom, nrich games and puzzles, Testbase, Comprehension Cards and Dip and Pick.

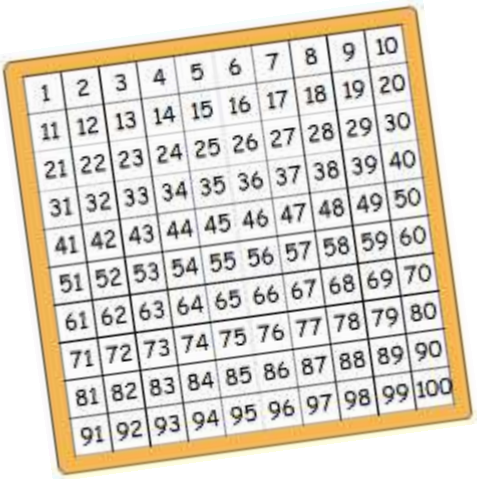
Subtraction

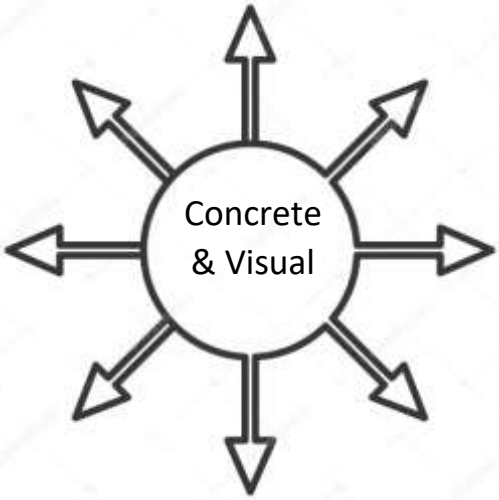
We use the following to help create a greater understanding

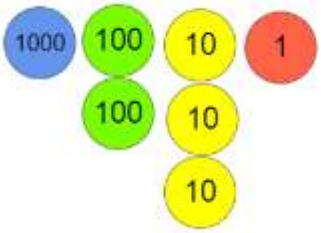


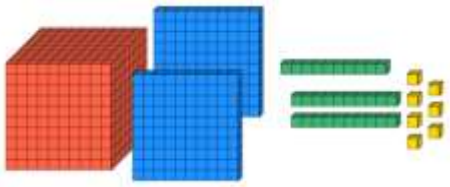


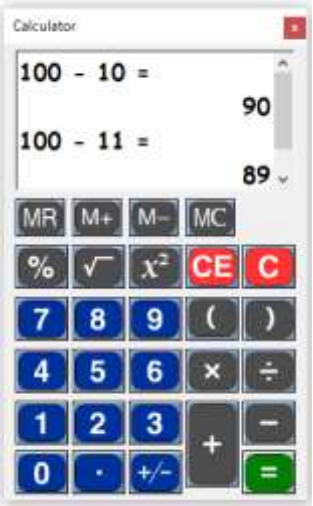


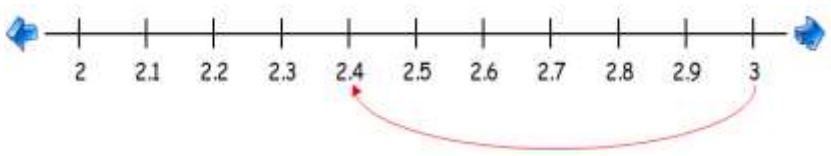












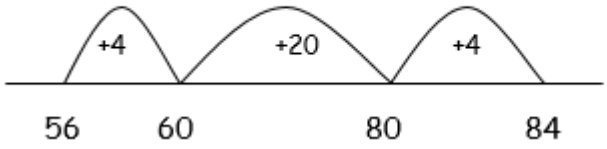
"The bar model helps me do work in small steps" Ethan, Year 4

KFJS Strategies

These abstract strategies, seen below, are introduced at different stages once an understanding using concrete and visual resources is in place.

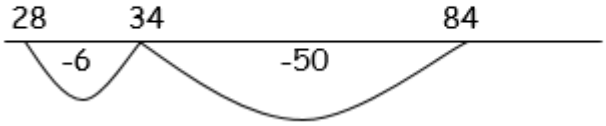
For details of what is expected in each year group, please see the 'Summary of Pitch'.

84 – 56 =



Counting on

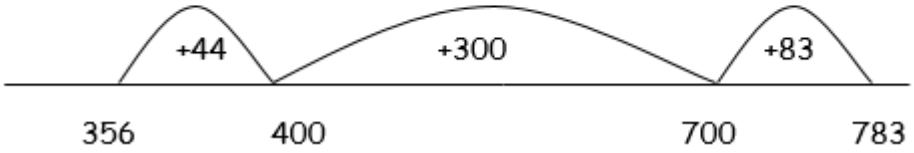
84 – 56 = 28



Counting back

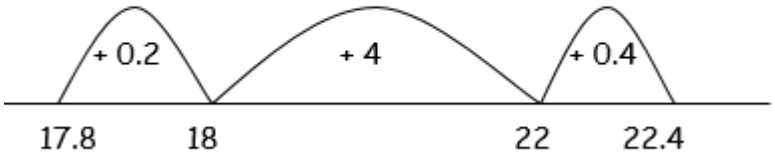
70
~~80~~ $^{1}4$
50 6
20 + 8 = 28

783 – 356



3 0 0
8 3
4 4
4 2 7
^{1}

22.4 - 17.8 = 4.6



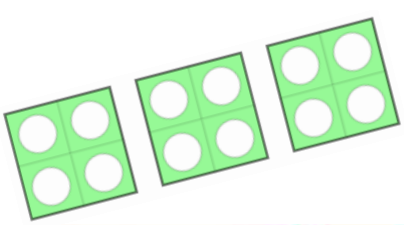
794 – 286 = 508

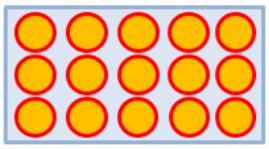
8
7 ~~9~~ $^{1}4$
- 2 8 6
5 0 8 = 508

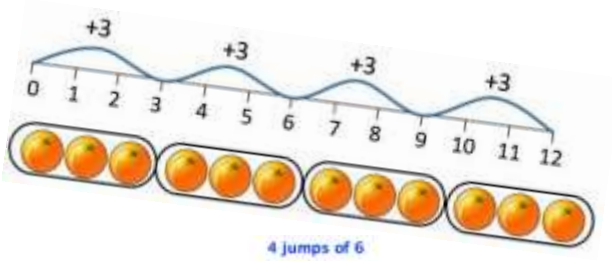
We make use of the following resources to support move children from fluency to reasoning: Target Your Maths, Fluent in 5, White Rose, Problem of the Day, I See Reasoning, Thinking Tom, nrich games and puzzles, Testbase, Comprehension Cards and Dip and Pick.

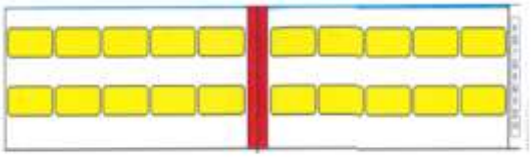
Multiplication

We use the following to help create a greater understanding



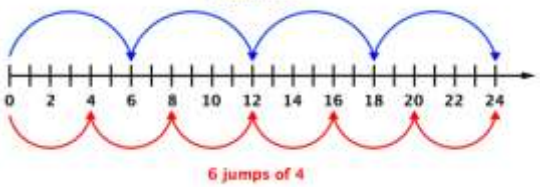




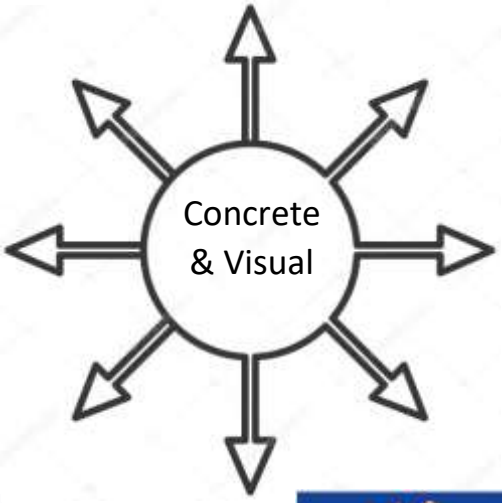


Think it .... Link it

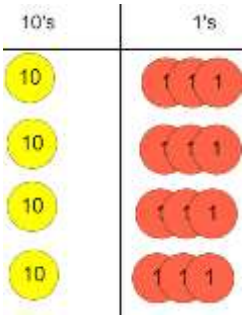
YouTube
Songs

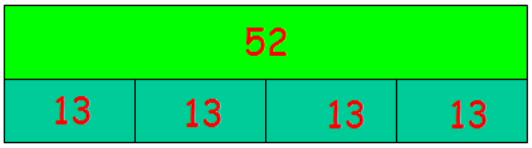


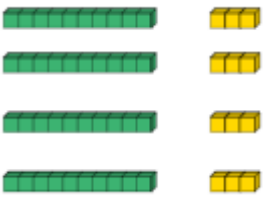
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40



×	1	2	3	4	5	6	7	8
1	1	2	3	4	5	6	7	8
2	2	4	6	8	10	12	14	16
3	3	6	9	12	15	18	21	24
4	4	8	12	16	20	24	28	32
5	5	10	15	20	25	30	35	40
6	6	12	18	24	30	36	42	48
7	7	14	21	28	35	42	49	56
8	8	16	24	32	40	48	56	64







×	30	5
7	210	35

210 + 35 = 245

"I understand it more if I use counters first." Chloe, Year 5

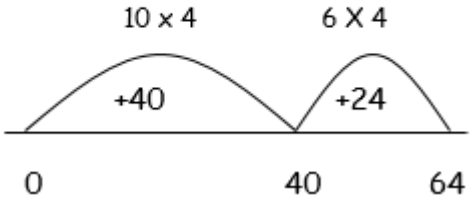
KFJS Strategies

These abstract strategies, seen below, are introduced at different stages once an understanding using concrete and visual resources is in place.

As a school we teach that 3 x 15 = 15 x 3. However, we model that the x symbol means 'lots of'. And in the above calculation, the number sentences will create different pictures to support thinking.

For details of what is expected in each year group, please see the 'Summary of Pitch'.

16 X 4 = 64



352 X 3 = 1056

3	5	2	
X		3	
		6	(3 X 2)
1	5	0	(3 X 50)
9	0	0	(3 X 300)
10	5	6	

352 X 3 = 1056

3	5	2	
X		3	
10	5	6	
1			

72 X 38 = 2736

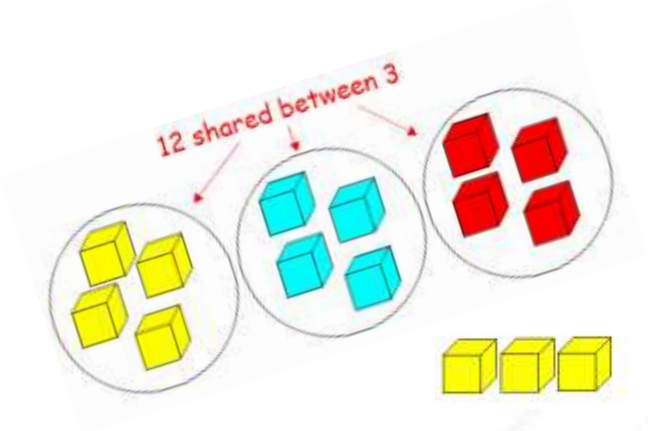
		7	2	
		3	8	
		1	6	(8 x 2)
	5	6	0	(8 X 70)
		6	0	(30 X 2)
2	1	0	0	(30 X 70)
2	7	3	6	

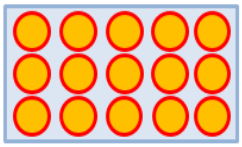
		7	2	
		3	8	
	5	7	6	(8 x 72)
2	1	6	0	(30 X 72)
2	7	3	6	
	1			

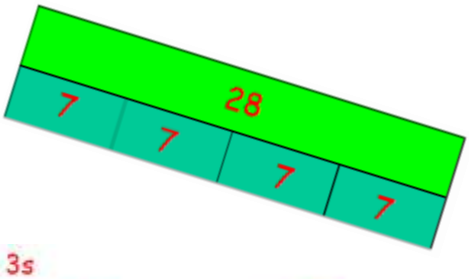
We make use of the following resources to support move children from fluency to reasoning: Target Your Maths, Fluent in 5, White Rose, Problem of the Day, I See Reasoning, Thinking Tom, nrich games and puzzles, Testbase, Comprehension Cards and Dip and Pick.

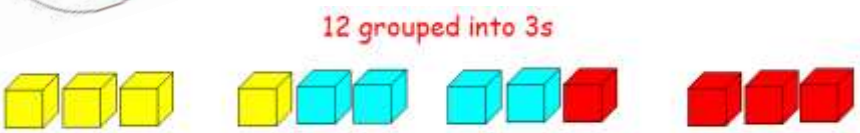
Division

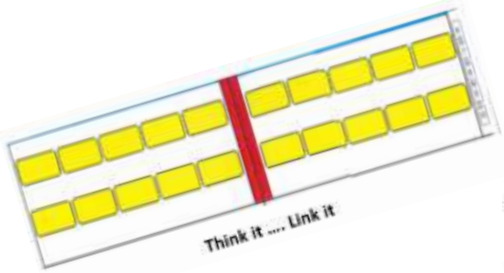
We use the following to help create a greater understanding

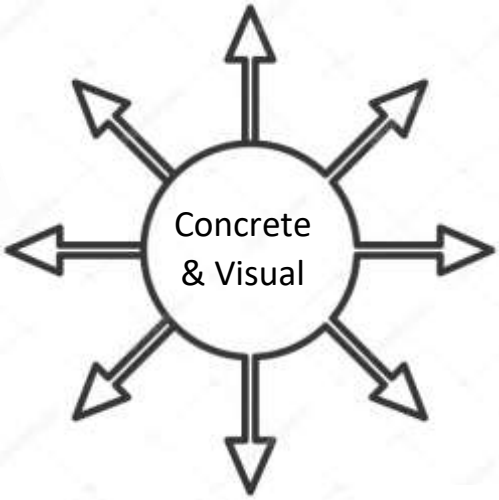


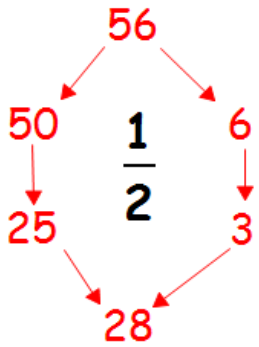


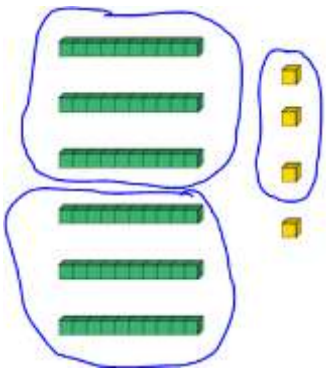


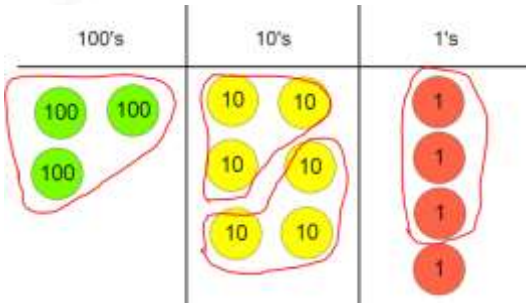












"The counters have numbers so are really quick to use." Heidi, Year 6.

KFJS Strategies

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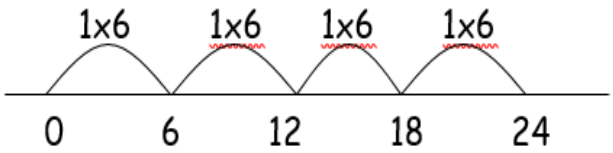
For details of what is expected in each year group, please see the 'Summary of Pitch'.

$24 \div 6 = 4$



4 lots of 6 to get to 24

When ready children should be challenged with questions that involve remainders (easier to do with contexts) and then questions where 10 lots of an amount can be used, e.g. 45 ÷ 3

The tools :

10 lots of 3 = 30
20 x 3 = 60
30 x 3 = 90
40 x 3 = 120
5 x 3 = 15
2 x 3 = 6

With practise children could see that they have 18 left and know that is 6x3.

Short division (bus stop)

Leading to knowing what to do with the remainder

$$\begin{array}{r} 0\ 4\ 6 \\ 3\overline{)\ 1\ 3\ {}^{1}8} \end{array}$$

$$\begin{array}{r} 0\ 3\ 4\ \text{r}1 \\ 4\overline{)\ 1\ {}^{1}3\ {}^{1}7} \end{array}$$

$$\begin{array}{r} 0\ 3\ 4\ \frac{1}{4} \\ 4\overline{)\ 1\ {}^{1}3\ {}^{1}7} \end{array}$$

$$\begin{array}{r} 0\ 3\ 4\cdot 2\ 5 \\ 4\overline{)\ 1\ {}^{1}3\ {}^{1}7\cdot {}^{1}0\ {}^{2}0} \end{array}$$

Long division

$$\begin{array}{r} 3{,}524\ \text{R}\ 6 \\ 24\overline{)\ 85{,}582} \\ \underline{72\ \downarrow} \\ 12\ 5 \\ \underline{12\ 0\ \downarrow} \\ 58 \\ \underline{48\ \downarrow} \\ 102 \\ \underline{96} \\ 6 \end{array}$$

We make use of the following resources to support move children from fluency to reasoning: Target Your Maths, Fluent in 5, White Rose, Problem of the Day, I See Reasoning, Thinking Tom, nrich games and puzzles, Testbase, Comprehension Cards and Dip and Pick.

Year 3 Overview

Year 3	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15
Term 1	Place value	Place value	Addition and sub-traction	Addition and sub-traction	Addition and sub-traction	Addition and sub-traction	Multi-plication and division	Multi-plication and division	Multi-plication and division	Geometry	Geometry	Test week buffer	Fractions	Fractions	Fractions
Term 2	Addition and sub-traction	Addition and sub-traction	Multi-plication and division	Multi-plication and division	Multi-plication and division	Fractions	Fractions	Test week buffer	Statistics	Statistics	Measure-ment	Measure-ment	x	x	x
Term 3	Addition and sub-traction	Multi-plication and division	Fractions	Fractions	Measure-ment	Measure-ment	Measure-ment	Test week buffer	Geometry	Geometry	Consolid-ation	Consolid-ation	x	x	x

CLAC Year 3

Counting	Learn Its	Apply It	Calculation
Forwards and backwards in different steps (numbers, fractions, decimals, time) • 4,8,50,100, 1/10, any fraction up to a whole. • Counting in 1s, 10s, 100s for measures • Multiples of 20,40,80,30 • 10p. 20p. 50p, 5p. 2p, 1p **Bridging key numbers** • +/- 10, 100 across 100 barrier • +/- 1,2,5 across 100 barrier **Reading and writing numbers** • Up to 1000 (numerals and words) • Reading fractions and drawing their value **Digit Value** • HTU (including Diennes) • 1/10 - what does it mean? **Ordering / Rounding** • Use > and < for HTU • Order unit fractions • Order fractions with the same denominator • Place fractions on a number line • Position HTU on a number line **Reading scales** • Estimating on a blank number line 0-10, 0-20, 0-50, 0-100, 0-1000 • Estimate on a number line with intervals of 10, 50, 100	**Over learning of key facts:** • Value of coins • Telling time – nearest minute • 60 sec = I minute, • 60 mins = 1 hour • 24 hours = 1 day • Number of days per month **Number bonds/Manipulation** • 146 = 100 + 40 +6 =130 + 16 • 8+7 can be 8+2+5, etc. **Conversions** Multiples of the following: • 10mm = 1cm • 100cm = 1m • 1kg = 1000g • 1litre = 1000ml ALL taught with visual aids **Fraction / Dec Equivalence** • Fractions can be equivalent to ½ - through pictures and real events eg. Test scores. **Tables (a few at a time)** • 2, 3, 4, 5, 8, 10 • Use fact families to help derive division facts.	**3+6 is always 9** • 3/10 + 6/10 = 9/10 • 5/7 – 1/7 = 4/7 **Fact families** • 4Q generated with bar model and triangle for x/+- • Used to check inverse • Missing number questions. **Doubling/halving** • Connect X2, X4, X8 • Double any 2d number • Halve all numbers <10 • Halve all numbers <20 • Halve all multiples of 10 to 100. **Number bonds to 100** • Multiples of 10 • Any 2d number • Coin value to £1, £2 **x / by 10, 100, 1000** • ÷10, link to 1/10 **Smile (but understanding why)** • Any 2d by 10 • Any multiple of 10 x d (select from tables taught so far) **What am I?** • Clues from tables learnt • Less than / greater than • 4 times as high • 8 times as long, etc. **Factors, Squares, multiples, prime** Multiples - See tables	**Small steps (learn the layout, or one step first)** Any from x÷+- • 2d + 2d > 100 • 2d x d • Unit fractions of amounts (bar) **Learned to do with resources** • HTU + U / + T / + H • Number bonds to 100 with bead string • X using PV discs **Explained to a partner as they go** • 3d + 3d • 3d – 3d • 4 x 12 x 5 = 4 x 5 x 12 = 20 x 12 = 2 x 12 x 10 **Number lines / Bar Model** • Multiples of 100 – multiples of 10 (<100) • Number bonds to 100 **Find the error** • Any of the above (once taught) *This column is very mix and match. Most strategies can be used for most calculations.* **Division expectations to be checked.*

20 minutes max, so If you can only do 3, pick up the other area another day.
Differentiated (split the board into 4) afl as children work
Quick, short bursts
Never done just once
In context – sometimes!
Use of resources taught (including concrete apparatus)
Revisit some elements more often.

Y3 Curriculum Objectives

Place Value

Identify, represent and estimate numbers using different representations.

Find 10 or 100 more or less than a given number; recognise the place value of each digit in a three digit number (hundreds, tens, ones).

Compare and order numbers up to 1000

Read and write numbers up to 1000 in numerals and in words.

Count from 0 in multiples of 50 and 100

Solve number problems and practical problems involving these ideas.

Addition and subtraction

Add and subtract numbers mentally, including: a three digit number and ones; a three-digit number and tens; a three digit number and hundreds.

Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction.

Estimate the answer to a calculation and use inverse operations to check answers.

Add and subtract amounts of money to give change, using both £ and p in practical contexts.

Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.

Multiplication and division

Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.

Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs.

Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.

Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.

Write and calculate mathematical statements for multiplication and division using the multiplication tables they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods.

Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in context.

Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objectives.

Fractions

Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators.

Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.

Count up and down in tenths.

Recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or

quantities by 10

Recognise and show, using diagrams, equivalent fractions with small denominators.

Add and subtract fractions with the same denominator within one whole.

Compare and order unit fractions, and fractions with the same denominators.

Solve problems that involve all of the above.

Measurement

Measure, compare, add and subtract: lengths (m/cm/mm).

Measure the perimeter of simple 2D shapes.

Continue to measure using the appropriate tools and units, progressing to using a wider range of measures, including comparing and using mixed and simple equivalents of mixed units.

Continue to measure using the appropriate tools and units, progressing to using a wider range of measures, including comparing and using mixed units (for example, 1kg and 200g) and simple equivalents of mixed units (for example, 5m = 500cm).

Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).

Estimate and read time with increasing accuracy to the nearest minute.

Record and compare time in terms of seconds, minutes and hours.

Use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight.

Know the number of seconds in a minute and the number of days in each month, year and leap year.

Compare durations of events (for example to calculate the time taken by particular events or tasks).

Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.

Geometry

Recognise angles as a property of shape or a description of a turn.

Identify right angles, recognise that two right angles make a half-term, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle.

Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.

Draw 2-D shapes and make 3-D shapes using modelling materials.

Recognise 3-D shapes in different orientations and describe them.

Statistics

Interpret and present data using bar charts, pictograms and tables.

Solve onestep and two-step questions (for example, 'How many more?' and 'How many fewer?') using information presented in scaled bar charts and pictograms and tables.

Year 4 Overview

Year 4	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15
Term 1	Place value	Place value	Addition and sub-traction	Addition and sub-traction	Addition and sub-traction	Measure-ment	Measure-ment	Statistics	Statistics	Multi-plication and division	Multi-plication and division	Test week buffer	Multi-plication and division	Geometry	Geometry
Term 2	Fractions	Fractions	Fractions	Addition and sub-traction	Addition and sub-traction	Decimals	Decimals	Test weel buffer	Measure-ment	Measure-ment	Geometry	Geometry	x	x	x
Term 3	Fractions	Fractions	Fractions	Addition and sub-traction	Multi-plication and division	Multi-plication and division	Statistics	Test week buffer	Measure-ment	Measure-ment	Consolid-ation	Consolid-ation	x	x	x

CLAC Year 4

Counting	Learn Its	Apply It	Calculation
Forwards and backwards in different steps (numbers, fractions, decimals, time) • 6,7,9,25,50 and 100 • Backwards through zero • Counting in 10s, 100s for numbers >1000 • 1/10 and 1/100 • Multiples of 0.6, 0.7, 0.9, 0.25, 0.5 and 0.01 **Bridging key numbers** • +/- 100 to any 4 digit number **Reading and writing numbers** • Up to 10,000 (words and numerals) **Digit Value** • ThHTU (incl. Diennes) • Know that 1/100 is 1/10 cut up into 10 • Know 1/10=0.1, 1/100=0.01 • Value of a 1dp and 2dp number in context, inc £ **Ordering** • Use > and < for ThHTU • Use > and < up to 2pd, in and out of context • Round to 10, 100, 1000 • Round 1dp to nearest U • Position multiples of 1/10, 1/100 on number line. • Also position ¼ ½ ¾ • For 2 positioning statements also include corresponding decimals **Reading scales** • Use of scales to 25, 250, 50, 500, multiples of 10; 0.25, 0.5 and 0.1	**Over learning of key facts:** • All tables up to 12x12 • x0, x1 for any number • 0.1=1/10, 0.01=1/100 • Multiples of the above **Number bonds/Manipulation** • 0.2+?=1, 0.56+?=1 • 0.8+0.7 = 0.8+0.2+0.5 • 0.99+0.35= 0.99+0.01+0.34 **Conversions** Multiples of: • Km↔m • m↔cm, cm↔mm • £↔p • Years↔months, weeks↔days, hrs↔mins, mins↔sec • 12↔24 hour clock **Fraction / Dec Equivalence** • Use pics for Eq. fractions • ¼ = 0.25, ½ = 0.5, ¾=0.75 • All fractions/decimal equivalence for multiples of 1/10 and 1/100 **Tables (a few at a time)** • Leading up to 12x12 • Link arrays to area	**3+6 is always 9** • +/- fractions with same denominator, eg. 4/9 + 3/9 **Fact families** • 4Qs generated from triangle for x and ÷ • 600÷3 = 200 from 200 x 3 From 2 x 3 **Doubling/halving** • Double any 1dp or 2pd • Halve any 1dp or 2dp ending with an even digit **Number bonds to 100** • 0.2+?=1, 0.56+?=1 • 0.8+0.7 = 0.8+0.2+0.5 • 0.99+0.35= 0.99+0.01+0.34 **x / by 10, 100, 1000** • 1dp or 2dp ÷ 10,100 identifying value as ones, tenths, hundredths. • Use to convert from m↔cm, cm↔mm, £↔p **Smile (but understanding why)** • 2 to 12 x multiples of 10, 100, 1000. • Link understanding to x by multiples of 0.1 **What am I?** • U x U x U • 8 times as high, 4 times as short, etc. **Factors, Squares, multiples, prime** • Pairs of factors • Multiples of Eq. fractions • Factors to simplify fractions	**Small steps (learn the layout, or one step first)** • 2d x d • 3d x d • +/- 4 digits • Short division, no remainders • +/- same denominator >1 **Learned to do with resources** • Commutative: 236 + 534 240 + 530 • Distributive: 3 x 62 (3 x 60) + (3 x 2) • Associative 2 x 3 x 4 3 x 4 x 2 *Terms not needed* **Explained to a partner as they go** • Fractions of amounts (incl. non-unitary) **Number lines** • +999 = +1000 - 1 **Find the error** • Inverse checking *This column is very mix and match. Most strategies can be used for most calculations.*

20 minutes max, so If you can only do 3, pick up the other area another day.
Differentiated (split the board into 4) afl as children work
Quick, short bursts
Never done just once
In context – sometimes!
Use of resources taught (including concrete apparatus)
Revisit some elements more often.

Y4 Curriculum Objectives

Place Value

Count in multiples of 6, 7, 9. 25 and 1000.

Find 1000 more or less than a given number.

Count backwards through zero to include negative numbers.

Recognise the place value of each digit in a four digit number (thousands, hundreds, tens and ones)

Order and compare numbers beyond 1000.

Identify, represent and estimate numbers using different representations.

Round any number to the nearest 10, 100 or 1000.

Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.

Solve number and practical problems that involve all of the above and with increasingly large positive numbers.

Addition and subtraction

Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.

Estimate and use inverse operations to check answers to a calculation.

Solve addition and subtraction two step problems in contexts, deciding which operations and methods to use and why.

Multiplication and division

Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers.

Recognise and use factor pairs and commutativity in mental calculations.

Multiply two digit and three digit numbers by a one digit number using formal written layout.

Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.

Recall and use multiplication and division facts for multiplication tables up to 12 x 12.

Fractions

Recognise and show, using diagrams, families of common equivalent fractions.

Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.

Add and subtract fractions with the same denominator.

Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number.

Decimals

Recognise and write decimal equivalents of any number of tenths or hundredths.

Recognise and write decimal equivalents to ¼, ½, ¾

Find the effect of dividing a one or two digit number by 10 or 100, identifying the value of the digits in the answer as ones, tenths and hundredths

Round decimals with one decimal place to the nearest whole number.

Compare numbers with the same number of decimal places up to two decimal places.

Measurement

Find the area of rectilinear shapes by counting squares.

Measure and calculate the perimeter of a rectilinear figure (including squares) in cm and m

Convert between different units of measure eg kilometre to metre.

Convert between different units of measure eg hour to minute.

Read, write & convert time between analogue and digital 12 and 14 hour clocks.

Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days

Solve simple measure and money problems involving fractions and decimals to two decimal places.

Estimate, compare and calculate different measures, including money in pounds and pence.

Geometry

Identify acute and obtuse angles and compare and order angles up to two right angles by size.

Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.

Identify lines of symmetry in 2D shapes presented in different orientations.

Complete an simple symmetric figure with respect to a specific line of symmetry.

Describe positions on a 2D grid as coordinates in the first quadrant.

Describe movements between positions as translations of a given unit to the left/ right and up/ down.

Plot specified points and draw sides to complete a given polygon.

Statistics

Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.

Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.

Year 5 Overview

Year 5	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15
Term 1	Place value	Place value	Addition and sub-traction	Addition and sub-traction	Addition and sub-traction	Multi-plication and division	Multi-plication and division	Fractions	Fractions	Fractions	Fractions	Test week buffer	Measure-ment	Measure-ment	Measure-ment
Term 2	Decimals	Decimals	Addition and sub-traction	Addition and sub-traction	Multi-plication and division	Multi-plication and division	Geometry	Test weel buffer	Geometry	Fractions	Fractions	Fractions	x	x	x
Term 3	Percentages	Percentages	Geometry	Geometry	Measure-ment	Measure-ment	Statistics	Test week buffer	Statistics	Statistics	Consolid-ation	Consolid-ation	x	x	x

CLAC Year 5

Counting	Learn Its	Apply It	Calculation
Forwards and backwards in different steps (numbers, fractions, decimals, time) • 10/100.100/10000/ 100000 • Crossing zero • 0.1 0.01 1/10 1/100 • Explain patterns in sequences • Any fraction crossing units barrier **Bridging key numbers** • Across H Th Tth Hth • Zero when it isn't a number in the sequence **Reading and writing numbers** • Any number up to 1000000 • Up to 3dp **Digit Value** • Value of each digit up to 1 million • A thousandth is 1/00 split into 10 • U . t h th **Ordering/Rounding** • Any number to 10, 100, 1000, 10000, 100000 • Fractions whose denominators are multiples of the same number • Round 2pd to 0.1 and 1 • < and > for 3pd • Order a mixed set of fractions / decimals **Reading scales** • Negative numbers • Measurements with a range of intervals	**Over learning of key facts:** • Square numbers **Number bonds/Manipulation** • 4 x 35 = 2 x 2 x 35 = 2 x 2 x 5 x 7 = 10 x 7 x 2 **Conversions** • Use x ÷ 10, 100, 1000 to convert between all standard units (mm, cm, m, Km, g, Kg, ml, l) **Fraction / Dec Equivalence** • Converting fractions whose denominators are multiples of the same number eg. 3/8 = ?/24 7/10 = 70/? • Multiples of 1/100 to a decimal and percentage, eg. 0.71 = 71/100 = 71% • Know simple frac/dec/% links for multiples of ¼, 1/10 • Converting improper and mixed fractions **Tables (a few at a time)** • Over learning of previous year.	**3+6 is always 9** • 2/5 + 4/5 = 6/5 (and convert) • +/- 3 multiples of 10, 100, 1000 eg. 700 + 900 + 400 • +/- t + t • U +/- tenths • U +/- multiples of 0.1 **Fact families** • 3600 ÷ 4 = using facts • 20 x 90 = **Doubling/halving** • Multiples of 0.1 **Number bonds to 100** • Compliments to 1 for 2dp • Number bonds to 60 to support telling time • 90/180/360 for missing angles **x / by 10, 100, 1000** • Whole and decimals by 10, 100, 1000 • Conversion between units • Scaling – 10 times bigger **Smile (but understanding why)** • See fact families • Used to support estimation, 3 x 598 **What am I?** • Use skills from this section **Factors, Squares, multiples, prime** • Factors of numbers <50 • Common factors • Recall primes to 19 and calculate to 50 • Prime factors • Find x^2 and x^3	**Small steps (learn the layout, or one step first)** • +/- 5 or more digits • 4d x d • 4d x 2d • 4d ÷ d (remainder as dec / fraction / rounded) **Learned to do with resources** • Interpret remainders of mental division Qs. • Calculate x^2 and x^3 • a(b + c) = ab + ac • Proper and mixed fractions x U **Explained to a partner as they go** • Rounding to support mental estimations • +/- fractions with same denominator, and when only one denominator needs changing (including sums >1) **Number lines / Bar Model** • Mentally +/- larger no.s eg. 12 462 – 2300 • Positioning mixed set of fractions/dec/perc on a number line (multiples of ½ ¼ 1/5 1/10 1/100) **Find the error** • Balancing Qs with a function per side • Finding fractions of amounts (inc. measures) • Finding % of amounts (50 25 10 20 30) • Simple algebra 4 + 2b = 20 *This column is very mix and match. Most strategies can be used for most calculations.*

20 minutes max, so If you can only do 3, pick up the other area another day.
Differentiated (split the board into 4) afl as children work
Quick, short bursts
Never done just once
In context – sometimes!
Use of resources taught (including concrete apparatus)
Revisit some elements more often.

Y5 Curriculum Objectives

Place Value

Read, write, order and compare numbers to at least 1000000 and determine the value of each digit.

Count forwards or backwards in steps of powers of 10 for any given number up to 1000000.

Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers including through zero.

Round any number up to 1000000 to the nearest 10, 100, 1000, 10000 and 100000

Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.

Solve number problems and practical problems that involve all of the above.

Addition and subtraction

Add and subtract numbers mentally with increasingly large numbers.

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 addition and subtraction multi-step problems in contexts deciding which operations and methods to use and why.

Multiplication and division

Multiply and divide numbers mentally drawing upon known facts.

Multiply and divide whole numbers 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 2 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.

Recognise and use square numbers and cube numbers and the notation for squared (2) and cubed (3)

Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes.

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

Solve problems involving addition and subtraction, multiplication and division and a combination of these, including understanding the use of the equals sign.

Fractions

Compare and order fractions whose denominators are multiples of the same number.

Identify, name and write equivalent fractions of a given fraction, represented visually including tenths and hundredths.

Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements >1 as a mixed number [for example 2/5 + 4/5 as mixed and improper]

Add and subtract fractions with the same denominator and denominators that are multiples of the same number.

Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.

Read and write decimal numbers as fractions [for example 0.71 = 71/100]

Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Decimals

Read, write, order and compare numbers with up to three decimal places.

Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.

Round decimals with two decimal places to the nearest whole number and to one decimal place.

Solve problems involving number up to three decimal places.

Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.

Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.

Percentages

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.

Solve problems which require knowing percentage and decimal equivalents of 1/2 1/4 1/5 2/5 4/5 …

… and those fractions with a denominator of a multiple of 10 or 25

Measurement

Convert between different units of metric measure (for example, km and m; cm and m; cm and mm; g and kg; l and ml)

Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints.

Solve problems involving converting between units of time.

Measure and calculate the perimeter of composite rectilinear shapes in cm and m.

Calculate and compare the area of rectangles (including squares), and including using standard units, cm2,m2 estimate the area of irregular shapes.

Estimate volume [for example using 1cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water]

Use all four operations to solve problems involving measure

Geometry

Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles.

Draw given angles, and measure them in degrees (o)

Identify: angles at a point and one whole turn (total 360o), angles at a point on a straight line and ½ a turn (total 180o) other multiples of 90o

Identify 3D shapes, including cubes and other cuboids, from 2D representations.

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.

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

Solve comparison, sum and difference problems using information presented in a line graph.

Complete, read and interpret information in tables including timetables.

Year 6 Overview

Year 6	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15
Term 1	Place value	Place value	4 rules	4 rules	4 rules	4 rules	Fractions	Fractions	Fractions	Fractions	Decimals	Test week buffer	Decimals	Percentages	Percentages
Term 2	Measure-ment	Measure-ment	Measure-ment	Geometry	Geometry	4 rules	Fractions	Test week buffer	Fractions	Ratio	Ratio	Algebra	x	x	x
Term 3	Statistics	Mock SATS	Statistics	SATS	Consolid-ation	Consolid-ation	Consolid-ation	Consolid-ation	Post SATS challenges	Post SATS challenges	Post SATS challenges	Post SATS challenges	x	x	X

Testing: Whole school data drop plus one other round per half term only – T1 wk 4 or 5 and T2 wk 2 or 3 are suggested.

End of unit tests should be used to identify children who require additional support.

CLAC Year 6

Counting	Learn Its	Apply It	Calculation
Forwards and backwards in different steps (numbers, fractions, decimals, time) • Into and out of –ve numbers where zero is not in the sequence. **Bridging key numbers** • Zero • Any multiple of 10 100 1000 10000 100000 1000000 in different sized jumps **Reading and writing numbers** • Up to 10 000 000 **Digit Value** • Up to 10 000 000 • 3dp in and out of context **Ordering / Rounding** • Round any number to any amount • Order fractions whose denominators have common factors. • Order mixed fractions, decimals and percentages **Reading scales** • Miles per hour and scaling questions based on understanding – how far in two hours.	**Over learning of key facts:** **Number bonds/Manipulation** **Conversions** • Length, mass, volume, time using decimal notation to 3dp where appropriate • Miles ↔ Km **Fraction / Dec Equivalence** • Simplify fractions linked to ½ and multiples of ¼ 1/10 1/5 and 1/100 **Tables** • Ideally these are all known by now. Use this an opportunity to build links and derive facts.	**3+6 is always 9** **Fact families** **Doubling/halving** **Number bonds to 100** • 90/180/360 to help calculate missing angles **x / by 10, 100, 1000** • x/÷ by 10, 100, 1000 for any number between 3dp and 10 000 000 **Smile (but understanding why)** • Used to support estimation of near multiples of 10, 100, etc. before calculations **What am I?** **Factors, Squares, multiples, prime** • **Common factors … to the be used to simplify fractions** • **Common multiples – used to support fractions** • **Prime numbers (known to 10, calculated to 50)**	**Small steps (learn the layout, or one step first)** • 4d x 2d • 4d ÷ 2d (interpreting remainders at each step) • +/- with mixed digits • ÷ where remainder is up to 2dp • U.th x U **Learned to do with resources** • +/- fractions with different denominators • Calculate equivalence eg. 3/8 = 0.375 • Finding the mean **Explained to a partner as they go** • BODMAS • Mental calculations with mixed operations and large numbers • Missing number Qs **Number lines / Bar Model** • Calculate intervals across zero • If ¼ = 36 what's the whole • Find 15% of 360 • Simple algebra • Algebra with 2 unknowns **Find the error** • X simple pairs of proper fractions • ÷ fractions by U *This column is very mix and match. Most strategies can be used for most calculations.*

20 minutes max, so If you can only do 3, pick up the other area another day.
Differentiated (split the board into 4) afl as children work
Quick, short bursts
Never done just once
In context – sometimes!
Use of resources taught (including concrete apparatus)
Revisit some elements more often.

Y6 Curriculum Objectives

Place Value

Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit.

Round any whole number to a required degree of accuracy.

Use negative numbers in context, and calculate intervals across zero.

Solve number and practical problems that involve all of the above.

4 rules

Solve addition and subtraction multi step problems in contexts, deciding which operations and methods to use and why.

Multiply multi-digit number up to 4 digits by a 2 digit number using the formal written method of long multiplication.

Divide numbers up to 4 digits by a 2 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.

Divide numbers up to 4 digits by a 2 digit number using the formal written method of short division, interpreting remainders according to context.

Perform mental calculations, including with mixed operations and large numbers.

Identify common factors, common multiples and prime numbers.

Use their knowledge of the order of operations to carry out calculations involving the four operations.

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.

Fractions

Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.

Compare and order fractions, including fractions > 1

Generate and describe linear number sequences (with fractions)

Add and subtract fractions with different denominations and mixed numbers, using the concept of equivalent fractions.

Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example 1/4 x 1/2 = 1/8]

Divide proper fractions by whole numbers [for example 1/3 ÷ 2 = 1/6]

Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example 3/8]

Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

Decimals

Identify the value of each digit in numbers given to three decimal places and multiply numbers by 10, 100 and 1000 giving answers up to 3dp.

Multiply one digit numbers with up to 2dp by whole numbers.

Use written division methods in cases where the answer has up to two decimal places.

Solve problems which require answers to be rounded to specified degrees of accuracy.

Percentages

Solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison.

Recall and use equivalences between simple FDP including in different contexts.

Measurement

Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.

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 3dp.

Convert between miles and kilometres.

Recognise that shapes with the same areas can have different perimeters and vice versa.

Recognise when it is possible to use formulae for area and volume of shapes.

Calculate the area of parallelograms and triangles.

Calculate, estimate and compare volume of cubes and cuboids using standard units, including cm3, m3 and extending to other units (mm3, km3)

Algebra

Use simple formulae

Generate and describe linear number sequences.

Express missing number problems algebraically.

Find pairs of numbers that satisfy an equation with two unknowns.

Enumerate possibilities of combinations of two variables.

Ratio

Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.

Solve problems involving similar shapes where the scale factor is known or can be found.

Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

Geometry

Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.

Statistics

Interpret and construct pie charts and line graphs and use these to solve problems.

Calculate the mean as an average.