Mathematics @ Chacewater School

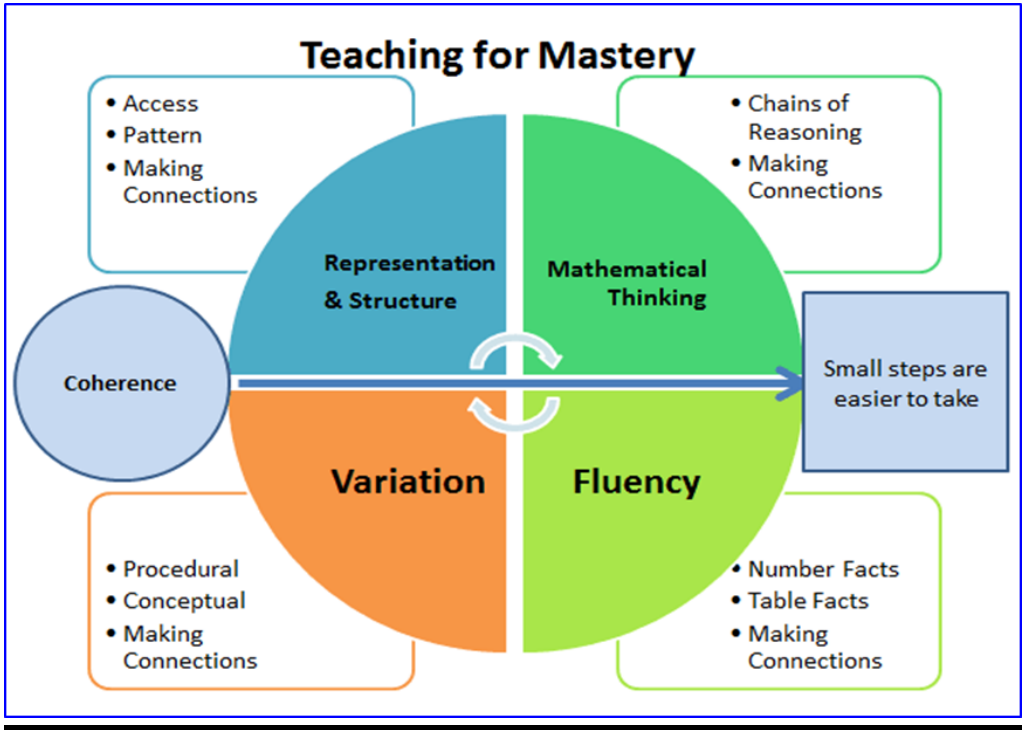
Intent	The national curriculum for mathematics aims to ensure that all pupils: •become fluent in the fundamentals of mathematics •reason mathematically by following a line of enquiry, conjecture relationships and generalisations, and develop an argument, justification or proof using mathematical language •can solve problems by applying their mathematics to a variety of routine and non routine problems. At Chacewater we want all of our children to enjoy mathematics, whilst ensuring that everyone is supported to be able to succeed in the subject and acquire the mathematical skills and knowledge that they need for later life. By lacing calculation, reasoning and problem solving into a series of lessons, we ensure that secure links are made and that prior knowledge is being tested and challenged throughout. Our aspiration is for every child to see themselves as a mathematician - demonstrating a confident attitude towards tackling problems both in and out of the classroom and understanding the importance of maths in the wider world.
Implementation	At Chacewater we follow a mastery led model for the teaching of mathematics. Sequences of learning are built in small sequential steps within our pedagogical approach of 'Teach, Learn, Challenge, Understand'. This 'Maths @ Chacewater' document intends to make clear what each of these stage could look like and how these should be closely related and linked to the five big ideas of fluency, variation, representation & structure, mathematical thinking and coherence. Maths is taught daily in the school in all classes, with our sequence of learning being pulled from White Rose maths, which gives a consistent and coherence across the school. However, our expectation is that this is not used as a scheme and only used to help aid the planning process by teachers. Blocks of learning are taught using a linear approach, allowing children to 'linger longer' on core concepts and to develop a depth of understanding within their year group's objectives.

	A wide range of trusted resources are used to support learning including, Kangaroo Maths, NCETM spine and ready to progress materials, I See Reasoning, I See Problem Solving, Time table Rockstars, Numbots and Testbase. Carefully planned variation builds fluency and understanding of underlying mathematical concepts. Time outside of the maths lesson is dedicated to the revisiting and retrieval of key declarative knowledge and rapid, fluid interventions are put in place to support those children that need it. Each year group focuses on **Key Instant Recall Facts (KIRFs)** that should be known by the end of each half term - there is a daily focus on these. Planning utilises the idea of small step progression and these are shared with the children so that they can understand the mathematical journey and how it builds. 'S' planning is utilised to help teachers think about the learning progression for their own class over a week or two week block and learning slides further support this. Ongoing assessment is crucial and is used to adjust and inform planned next steps. Both **concrete resources (manipulatives) and pictorial representations** are routinely used to support **all** children, including children with SEND. These are also referenced in our calculation guidance.
Impact	Teachers will continuously formatively assess children's understanding and use this to adjust and inform the next steps in the teaching sequence. This is supported by utilising a range of reasoning and problem-solving activities i.e. Test Base to check children's ability to use and apply the mathematics taught. There is a regular cycle of assessment in place, which includes termly NFER tests in key stage 2 and termly teacher assessment across the school. Wider impact is measured through a triangulated approach. Exploring attitude and confidence with mathematics through pupil conferencing in conjunction with exploring evidence in books. The journey of the mathematics the children are learning should be clear and the children should be able to confidently articulate this.

‘L E A P’ Into Maths at Chacewater

L ocal	Where possible we look to link learning to our own school’s contextual background. This is includes taking note of children’s starting points and prior learning. With this is mind, although we use White Rose to help support and guide our sequence of learning, this is not used as a scheme and the expectation is that lessons and sequences are adapted to meet the needs of our children. We use ‘S’ planning to support this approach.
E ngaging	It is important that mathematics is engaging for all of our children and to support this we ensure that there are a range of learning activities and resources to support. This includes consistent use of representations and structures. We aim to engage children in the learning by encouraging them to frequently explore, reason and problem solve. This is supported by high quality resources such as the ‘I See Reasoning’ resources. NRICH, NCETM spine and ready to progress materials. Across the school we use a range if interactive resources and learning activities so that learning is not just worksheet based. This includes frequent opportunities for discussion (supported with STEM sentences) and interactive resources such as TTRS and Numbots. WE ALWAYS LOOK TO REWARD AND CELEBRATE EVERY SUCCESS IN MATHS.
A spiring & Ambitious	Our aim to take all children through the same mathematical journey. The use of low threshold and high ceiling activities supports this, as well as rapid interventions, including same day interventions and pre-teach. The ‘challenge’ aspect of our pedagogical approach allows us to look for opportunities to add a ‘twist’ or ‘confuse’ aspect into learning to really promote a depth of understanding!
P owerful & purposeful	In line with other aspects of our curriculum regular review and opportunities to practise retrieval are important to ensure that learning is retained, is powerful and purposeful. To facilitate this, previous areas of learning are regularly revisited outside of the maths lesson to ensure that key areas remain fresh in the children’s memory i.e. written calculations. This includes the use of morning boards and resources such as Flashback 4. Reasoning and Problem Solving should be weaved through all aspects of maths to ensure that all children are given the opportunity to be able to apply their mathematical knowledge.

At Chacewater we follow a mastery led model for the teaching of mathematics. Sequences of learning are built in small sequential steps within our pedagogical approach of 'Teach, Challenge, Learn, Understand'. This 'Maths @ Chacewater' document intends to make clear what each of these stage could look like and how these should be closely related and linked to the five big ideas fluency, variation, representation & structure, mathematical thinking and coherence.



Our aim is that children work broadly at the same pace, focusing on increasing a depth of understanding rather than a focus on progressing beyond ARE. Rapid interventions should be in place for children that need to consolidate their understanding before moving on.

Typical Lesson Design

PRE-LESSON (MORNING WORK) MASTERING NUMBER ETC

KIRFS FLUENCY DECLARATIVE KNOWLEDGE

TEACH (Ready to Learn)

Retrieval – question (s) based on previous lesson/s and assessment
Low Stakes Quizzes Used to assess security and determine starting points
Building Automaticity
Representation and Structure used to scaffold learning

LEARN (Learning Together)

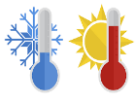
Representation and Structure used to scaffold learning
Effective Questioning to promote thinking
Independent Activity/Learning – carefully chosen variation

CHALLENGE

Reasoning and Problem Solving (modelled at first)
Progression in questioning
Conjecturing and testing.

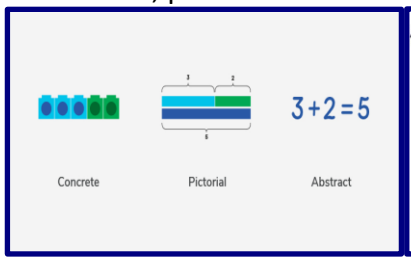
UNDERSTAND (Assessment)

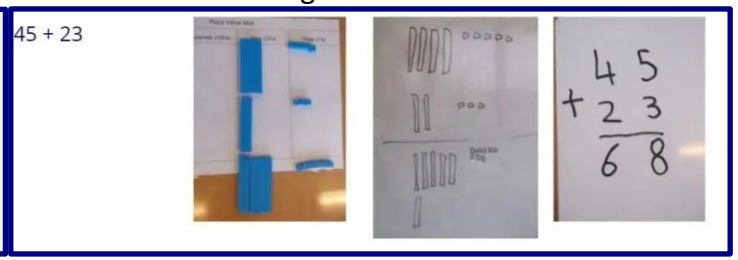
Application of learning in a different context e.g. Testbase
Live marking and immediate feedback
Low Stakes Quizzes to check understanding



TEACH *Retrieval* *Fluency*	The National Curriculum states that children should become fluent in the fundamentals of mathematics through varied and frequent practice, and this is the main aim of our 'Teach' phase. While a part of this is about knowing key mathematical facts and recalling them efficiently, the ability to be fluent in maths gives pupils the resilience and understanding to delve deeper into all areas of mathematical learning. Regular development will allow them to build a stronger number sense and choose the most appropriate method for the task at hand. This will enable them to be better equipped to grapple with many variations of mathematical concepts and problems.

- Concrete resources are routinely used to support learning. These are used by all children and help children to understand the underlying structure of the maths being taught. Key resources include **PV counters, dienes (base 10), PV grids, numicon and hundred squares.**
- Side by side modelling of the concrete, pictorial and abstract is crucial at this stage.





LEARN

Guided Practice

Independent Practice

At this stage children should be given an opportunity to build learning and the use of carefully structured questions should be in place, including:

- use of variation to help scaffold and draw links in learning. Deliberate choice of question and thinking about what we want to draw attention to.
- choice of the most efficient calculation strategy i.e. mental or written
- pattern seeking
- continued support with concrete and pictorial, moving to the abstract.

Variation – drawing attention to relationships.

120 – 90
122 – 92
119 – 89
235 – 180
237 – 182
502 – 397

430 – 30 =
430 – 40=
430 – 50 =
520 – 30 =
520 – 31 =
520 – 29 =

3 + 6 =
30 + 60 =
300 + 600 =

$\frac{1}{4}$ *of* 12 = ?

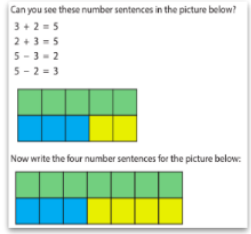
$\frac{1}{4}$ *of* 120 = ?

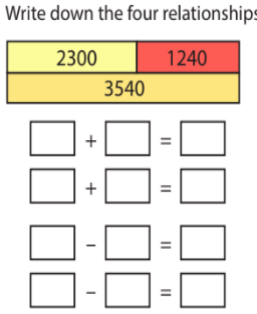
$\frac{1}{4}$ *of* 1200 = ?

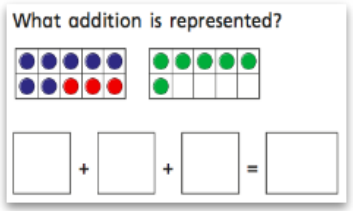
$\frac{3}{4}$ *of* 12 = ?

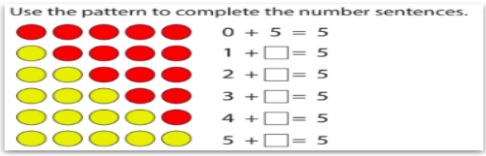
$\frac{3}{4}$ *of* 1200 = ?

Exploring mathematics - identifying structure.

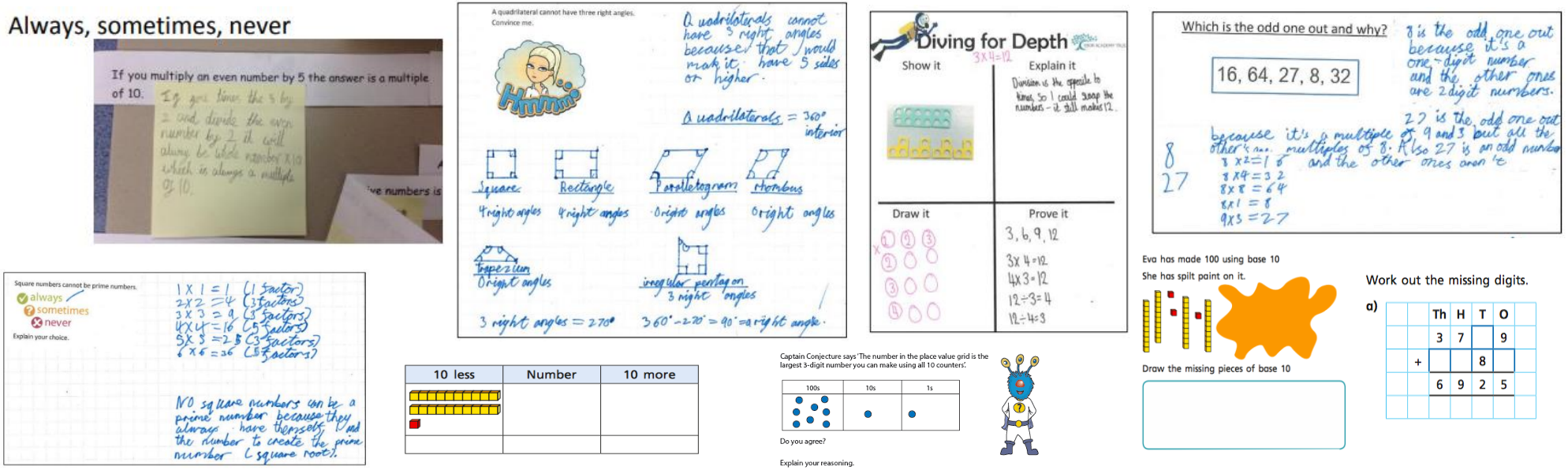








CHALLENGE *Reasoning & Problem Solving*	In order to ensure deep understanding, challenge elements will be incorporated in to the teaching sequence. The challenge could be a 'twist' or a 'confuse' question within the lesson or an activity within the books. Such activities allow the children to demonstrate their knowledge in a different way and thus provides depth of understanding. These can be written or through verbal discussion and applies to all year groups. Reasoning and Problem Solving should flow through all of our maths lessons and not reserved purely as extension activities. In all cases it is crucial that there is explicit teaching and modelling of how to tackle such problems. Examples below include opportunities to develop efficiency, conjecture and solve missing digit problems.



UNDERSTAND	It is crucial that all children have the opportunity to apply their mathematical knowledge in a variety of different contexts and can actively problem solve. This includes being able to solve single and multi-step problems, relevant to age and stage. We use Testbase as resources to find a range of different problems and the expectation is that children are explicitly taught how to solve these. Such problems may at times draw in other areas of previous learning to aid the problem solving process.

There are **20** balloons.

7 balloons fly away.

How many balloons are left?

balloons

Find 3 different possible answers:

Sandwich: £1.80
Drink: 30p

I buy ☐ sandwich(es) and ☐ drink(s).
I pay with a **£5** note. I get ☐ change.

I buy ☐ sandwich(es) and ☐ drink(s).
I pay with a **£5** note. I get ☐ change.

I buy ☐ sandwich(es) and ☐ drink(s).
I pay with a **£5** note. I get ☐ change.

Look at these coins:

What is the largest amount you can make using **three** of these coins?

p

A shopkeeper has **20** fish and **5** fish bowls.

He puts the same number of fish in each bowl.

How many fish go in each bowl?

fish

1 Kirsty, Seb and Mina made toffee apples to sell at the school fair.

They made **80** toffee apples altogether.

Kirsty sold **12** toffee apples.

Seb sold **25** toffee apples.

Mina sold **17** toffee apples.

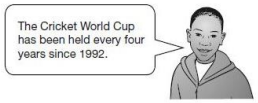
How many toffee apples were left?

Show your method

The list below shows the years in which the Cricket World Cup was held since 1992:

1992, 1996, 1999, 2003, 2007, 2011, 2015

Adam says,



Adam is **not** correct.

Explain how you know.

Only a fraction of each line is shown. The rest is hidden behind the blue screen.
Which whole line is the longer?

Explain your reasoning.

Megan has read $\frac{3}{5}$ of her book.

She has 90 pages left to read.

How many pages long is her book?

Amy has a box containing ordinary domino pieces but she does not think it is a complete set.

She has 24 dominoes in her box and there are 125 spots on them altogether.

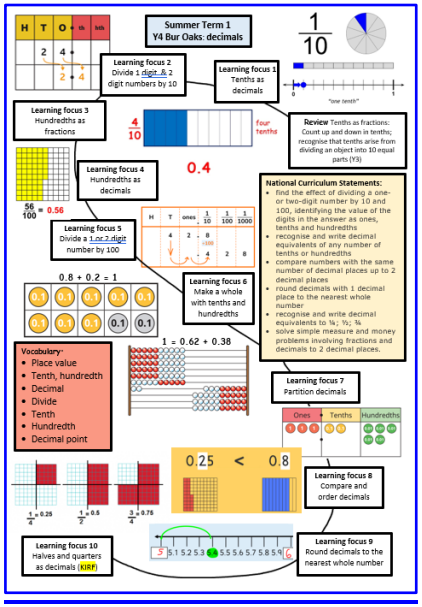
Which of her domino pieces are missing?

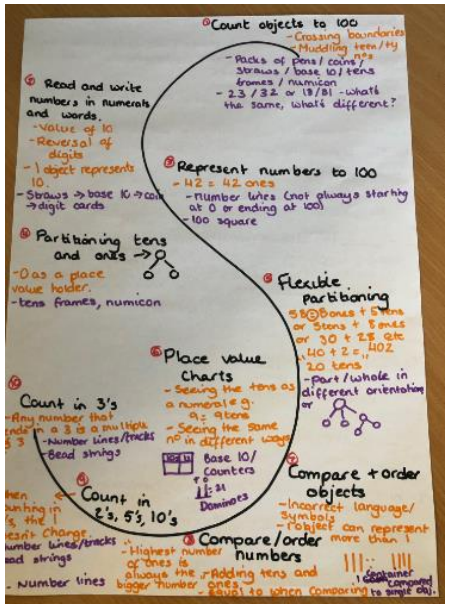
Sequences of Learning

At Chacewater School we use White Rose maths as the golden thread to our curriculum which guides our sequences of learning and ensures curriculum coverage, however we do not use this as a scheme. Teachers start with the White Rose sequence but then adapt this to best fit the needs of the children in their class. This means that the time spent on different domains will differ from year to year depending on children's progression and understanding.

S planning is used to make and show this adaptation. This means that deliberate choices are made with regard to small steps of progression that need to be worked on to ensure a depth of understanding.

Examples of S Planning – identifying small steps progression.





Sequences of Learning

Reception (For full details see separate EYFS maths document)

Long Term Plan:	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS Links to	Number	Number patterns and Shape, Space and Measure	Number	Number	Shape, Space and Measure	Number patterns and Shape, Space and Measure
EYFS Framework and supported by Development Matters strands	Fast recognition of up to 3 objects, without having to count them individually ('subitising'). Recite numbers past 5. Say one number for each item in order: 1,2,3,4,5.	Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle'). Show 'finger numbers' up to 5. Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5. Experiment with their own symbols and marks as well as numerals. Solve real world mathematical	Continue, copy and create repeating patterns.	Explore the composition of numbers to 10. Automatically recall number bonds for numbers 0–10.	Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'. Select, rotate and manipulate shapes in order to develop spatial reasoning skills. Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.	Count beyond ten. Compare numbers. Verbally count beyond 20, recognising the pattern of the counting system. Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.

		problems with numbers up to 5.				
Mastering Number focus	Subitising Composition Counting, cardinality and ordinality Subitising	Composition Counting, ordinality and cardinality Composition x 3 weeks Counting, ordinality and cardinality	Subitising Counting, cardinality and ordinality Composition x 3	Counting, ordinality and cardinality Composition x 4 weeks	Counting, ordinality and cardinality Subitising Composition x 3 weeks	Recap composition, counting, and counting patterns.
White Rose planning to support Number units (if needed) – Not to be taught explicitly.	Getting to know you (first 2 weeks) Early number to 3. Teaching to 5 - 1,2,3,4,5		Alive in 5 Moving onto 6,7,8	Building 9 and 10 Sharing and grouping		To 20 and beyond
White Rose Focus to support Shape Space and Measure Units (if needed)		Match sort and compare Patterns Visualise build and map (patterns)			Shapes- triangles and circles Shapes with 4 sides Learning 3D shapes Manipulate, compose	Mass and capacity Length height and time

Declarative Knowledge Facts to be learnt	**Place Value** Children begin using numbers and counting up to 5. Children begin using numbers and counting up to 10. **Comparing number** Children compare quantities of identical objects and non-identical objects. Children compare groups of objects and numbers up to 10. **Identifying, Representing and Estimating Number** Children are introduced to doubling, halving and sharing numbers and objects within numerical patterns. Children learn which numbers are odd and which numbers are even as well as understanding why **Number bonds** Children find changes within 5. Children combine two groups to find the whole amount. Children are introduced to the part whole model and learning how to use it with numbers up to 10. **Mental Calculation** Children find one more and one less. Children learn how to add by counting on. Children learn how to take away by counting back. **Measurement** Children are introduced to length, height, distance, weight, volume and capacity using numbers, objects and practical exploration. **Geometry** Children are introduced to 2D shapes and 3D shapes learning their names and recognising them. Children begin making simple patterns then once confident, explore more complex patterns.

ELGs:	**ELG Number=** <u>Children at the expected level of development will:</u> - Have a deep understanding of number to 10, including the composition of each number; - Subitise (recognise quantities without counting) up to 5; - Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.
	ELG Numerical Patterns= <u>Children at the expected level of development will:</u> - Verbally count beyond 20, recognising the pattern of the counting system; - Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity; - Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

Year 1 - Autumn												
Week	1	2	3	4	5	6	7	8	9	10	11	12
KIRF	Know All Number Bonds For 5						Know All Number Bonds For 10					
	Place Value (within 10)				Addition & Subtraction					Shape	Place Value (within 20)	
Suggested Sequence	• Sort Objects • Count Objects • Represent Objects • Count on within 10 • Count backwards within 10 • Count one more • Count one less • One to one correspondence to compare groups • Compare Groups – equal, more/greater than, less/fewer than • < > and = symbols • Compare numbers • Order groups of objects • Order numbers • Ordinal numbers (1st, 2nd, 3rd …) • Introduction to the number line				• Part Whole Model • Introducing the addition symbol • Addition Facts (fact families) • Number bonds within 10 • Number bonds to 10 • Compare number bonds • Addition – adding together • Addition - adding more • Addition – using bonds • Finding a Part • Subtraction – taking away • Introduction to the take away symbol • Subtraction – finding a part • Fact families - the 8 facts • Subtraction - counting back • Subtraction - finding the difference • Comparing addition and subtraction statements						• Recognise 3D shapes • Name 3D shapes • Sort 3D shapes • Recognise 2D shapes • Name 2D shapes • Explore patterns with shapes	• Count forwards and backwards • Write numerals in numerals and words • Numbers 11-20 • Tens and ones • Count one more and one less • Compare groups • Compare numbers • Order groups of objects • Order numbers

End Point (NCETM Progression)	✓ count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number ✓ count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens ✓ given a number, identify one more and one less ✓ use the language of: equal to, more than, less than (fewer), most, least ✓ identify and represent numbers using objects and pictorial representations including the number line ✓ read and write numbers from 1 to 20 in numerals and words.	✓ represent and use number bonds and related subtraction facts within 20 ✓ add and subtract one-digit and two-digit numbers to 20, including zero ✓ read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs ✓ solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as ✓ 7 = □ - 9	✓ recognise and name common 2-D and 3-D shapes, including: ○ 2-D shapes [e.g. rectangles (including squares), circles and triangles] ✓ 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres].	✓ count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number ✓ count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens ✓ given a number, identify one more and one less ✓ use the language of: equal to, more than, less than (fewer), most, least ✓ identify and represent numbers using objects and pictorial representations including the number line ✓ read and write numbers from 1 to 20 in numerals and words.

Year 1 - Spring Term

Week	1	2	3	4	5	6	7	8	9	10	11	12
KIRF	Know all number bonds to 20						Know all doubles and halves of even numbers to 20					
	Consolidation	Addition & Subtraction (within 20)			Place Value (within 50)			Length & Height		Weight & Volume		Consolidation
Suggested Sequence		• Add by counting on • Add using number bonds • Find and make number bonds • Add by making 10 • Subtraction – not crossing 10 ○ Counting back • Subtraction crossing 10 ○ Counting back • Using related facts • Compare number sentences			• Numbers to 50 • Counting forwards and backwards within 50 • Tens and ones • Represent numbers to 50 • One more and one less • Compare objects within 50 • Compare numbers within 50 • Order numbers within 50 • Count in 2s • Count in 5s			• Compare lengths • Compare heights • Measure length • Introduction to the ruler • Measuring length (2) • Adding length problems • Subtracting length problems		• Introduce weight and mass • Measure mass • Compare mass • Weight and mass problem solving • Introduce capacity and volume • Measure capacity • Compare capacity		
End Point (NCETM Progression)		✓ represent and use number bonds and related subtraction facts within 20 ✓ add and subtract one-digit and two-digit numbers to 20, including zero ✓ read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs			✓ count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number ✓ count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens ✓ given a number, identify one more and one less ✓ use the language of: equal to, more than, less than (fewer), most, least			compare, describe and solve practical problems for: ✓ lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half] measure and begin to record the following: ✓ **lengths and heights**		compare, describe and solve practical problems for: ✓ mass/weight [e.g. heavy/light, heavier than, lighter than] ✓ capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter]		

		✓ solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as ✓ 7 = □ - 9	✓ identify and represent numbers using objects and pictorial representations including the number line ✓ read and write numbers from 1 to 20 in numerals and words.		measure and begin to record the following: ✓ **mass/weight** ✓ **capacity and volume**	

Year 1 - Summer Term											
Week	1	2	3	4	5	6	7	8	9	10	11	12
KIRF	Know all addition and subtraction facts for all numbers between 0 and 10.						Count forwards and backwards in steps of 2,5 and 10.					
	Consolidation	Multiplication & Division			Fractions		Position	Place Value (within 100)		Money	Time	
Suggested Sequence		• Count in 10s • Make equal groups • Add equal groups • Make arrays • Make doubles • Make equal groups - grouping • Make equal groups - sharing			• Make half • Make a whole • Find a half • Find a half of a quanitity • Make a quarter • Find a quarter • Find a quarter of a quanitity		• Describe turns • Describe position	• Counting to 100 (making 10s) • Counting forwards and backwards within 100 • Introduction to the 100 square • Partitioning numbers • Comparing numbers • Ordering numbers		• Recognise coins • Recognise notes • Count in coins	• Before and after • Dates • Time to the hour • Time to the half hour • Writing time • Comparing time	

					• One more and one less		
End Point (NCETM Progression)		✓ count in multiples of twos, fives and tens ✓ solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	✓ recognise, find and name a half as one of two equal parts of an object, shape or quantity ✓ recognise, find and name a quarter as one of four equal parts of an object, shape or quantity	✓ describe position, direction and movement, including half, quarter and three-quarter turns.	✓ count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number ✓ count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens ✓ given a number, identify one more and one less ✓ use the language of: equal to, more than, less than (fewer), most, least ✓ identify and represent numbers using objects and pictorial representations including the number line ✓ read and write numbers from 1 to	✓ recognise and know the value of different denominations of **coins and notes**	✓ tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. ✓ recognise and use language relating to dates, including days of the week, weeks, months and years

					20 in numerals and words.		

Year 2 - Autumn Term

Week	1	2	3	4	5	6	7	8	9	10	11	12
KIRF	Know all number bonds for 10 and 20.							**Know multiplication and division facts for 2x table.**				
	Place Value			Addition and Subtraction					Money		X and /	Consolidation
Suggested Sequence	• Counting objects to 100 • Read and write numbers in numerals and words • Represent numbers to 100 • Tens and ones with a part-whole model • Tens and ones using addition • Using a place value chart • Compare objects • Compare numbers • Order objects and numbers • Count in 2,5s and 10s			• Fact families - addition and subtraction bonds to 20 • Checking calculations • Compare number sentences • Number bonds • Related facts • Bonds to 100 • Add and subtract 1s • 10 more and 10 less • Add and subtract 10s • Add a 2digit and 1-digit number – crossing 10 • Subtract a 1-digit number from a 2 digit number - crossing 10 • Add two 2-digit numbers – not crossing 10 • Add two 2-digit numbers - crossing 10 • Subtract a 2-dgit number from a 2-dgit number – not crossing 10 • Subtract a 2-digit numbers from a 2-digit number – crossing 10 • Bonds to 100 • Add three 1-digit numbers				• Count money – pence • Count money – pounds • Count money – notes and coins • Select money • Make the same amount • Compare money • Find the total • Find the difference • Find change • Two-step problems (money)		• Make equal groups • Equal and unequal groups • Add equal groups • Make arrays	

End Point (NCETM Progression)	✓ count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward ✓ compare and order numbers from 0 up to 100; use <, > and = signs ✓ identify, represent and estimate numbers using different representations, including the number line ✓ read and write numbers to at least 100 in numerals and in words ✓ recognise the place value of each digit in a two-digit number (tens, ones) ✓ use place value and number facts to solve problems	✓ recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 ✓ add and subtract numbers using concrete objects, pictorial representations, and mentally, including: ✓ a two-digit number and ones ✓ a two-digit number and tens ✓ two two-digit numbers ✓ adding three one-digit numbers ✓ show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot ✓ recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. ✓ solve problems with addition and subtraction: ✓ using concrete objects and pictorial representations, including those involving numbers, quantities and measures ✓ applying their increasing knowledge of mental and written methods ✓ solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change	✓ recognise and use symbols for pounds **(£) and pence (p)**; combine amounts to make a particular value ✓ find different combinations of coins that equal the same amounts of money ✓ **solve simple problems** in a practical context involving addition and subtraction of money of the same unit, including giving change	✓ solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	

Year 2 - Spring Term

Week	1	2	3	4	5	6	7	8	9	10	11	12
KIRF	**Know multiplication and division facts for 10x table.**						Know the halves of 1,3,5,7,9 e.g. half of 3 is 1 ½					
	Multiplication & Division				Statistics		Properties of Shape			Fractions		
Suggested Sequence	• Recognise equal groups • Make equal groups • Add equal groups • Multiplication sentences - using the x symbol • Multiplication from pictures/representations • Use arrays • 2 times-table • 5 times-table • 10 times-table • Make equal groups – sharing • Make equal groups – grouping • Divide by 2 • Odd and even numbers • Divide by 5 • Divide by 10				• Make tally charts • Draw pictograms • Interpret pictograms • Extend drawing of pictograms (2,5,10) • Interpret pictograms (2,5,10) • Block diagrams		• Recognise 2D and 3D shapes • Count sides on 2D shapes • Count vertices on 2D shapes • Draw 2D shapes • Lines of symmetry • Sort 2D shapes • Make patterns with 2D shapes • Count faces on 3D shapes • Count edges on 3D shapes • Count vertices on 3D shapes • Sort 3D shapes • Make patterns with 3D shapes			• Make equal parts • Recognise a half • Find a half • Recognise a quarter • Find a quarter • Recognise a third • Find a third • Unit fractions • Non-unit fractions • Equivalence of a half and 2 quarters • Find three quarters • Count in fractions • Problem solving with fractions		

End Point (NCETM Progression)	✓ count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward ✓ recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers ✓ show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot ✓ calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs ✓ solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	✓ interpret and construct simple pictograms, tally charts, block diagrams and simple tables ✓ ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity ✓ ask and answer questions about totalling and comparing categorical data	✓ identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line ✓ identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces ✓ identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] ✓ compare and sort common 2-D and 3-D shapes and everyday objects	✓ count in fractions up to 10, starting from any number and using the1/2 and 2/4 equivalence on the number line ✓ recognise, find, name and write fractions $^1/_3$, $^1/_4$, $^2/_4$ and $^3/_4$ of a length, shape, set of objects or quantity ✓ write simple fractions e.g. $^1/_2$ of 6 = 3 and recognise the equivalence of $^2/_4$ and $^1/_2$.

Year 2 - Summer Term

Week	1	2	3	4	5	6	7	8	9	10	11	12
KIRF	Know all addition and subtraction facts for multiples of 10 to 100.						**Know multiplication and division facts for 5x table.**					
	Length & Height		Position & Direction		Problem Solving		Time		Mass, capacity and temperature			Consolidation
Suggested Sequence	• Measure length (cm) • Measure length (m) • Compare lengths • Order lengths • Four operations with lengths • Problem solving with lengths		• Problem solving with position • Describe movement • Describe turns • Describe movements and turns • Make patterns with shapes		Consolidation period		• O'clock and half past • Quarter past and quarter to • Telling time to 5 mins • Hours and days • Find durations of time • Compare durations of time		• Compare mass • Measure mass in grams • Measure mass in kg • Compare volume • Explore Millilitres • Explore Litres • Four operations with mass • Four operations with volume • Explore temperature			
End Point (NCETM Progression)	✓ compare and order lengths and record the results using >, < and = ✓ choose and use appropriate standard units to estimate and measure		✓ use mathematical vocabulary to describe position, direction and movement including movement in a straight line and distinguishing				✓ tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times.		✓ compare and order mass, volume/capacity and record the results using >, < and = ✓ choose and use appropriate standard units to estimate and measure **mass** (kg/g); **temperature** (°C); **capacity** (litres/ml) to the nearest			

	length/height in any direction (m/cm); appropriate unit, using rulers.	between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise) ✓ order and arrange combinations of mathematical objects in patterns and sequences		✓ know the number of minutes in an hour and the number of hours in a day. ✓ know the number of minutes in an hour and the number of hours in a day.	appropriate unit, using rulers, scales, thermometers and measuring vessels	

Year 3 - Autumn Term

Week	1	2	3	4	5	6	7	8	9	10	11	12
KIRF	Know all the number bonds for each number to 20 e.g. 13+6 = 19						**Know multiplication and division facts for 2x, 4x and 8x table.**					

	Place Value	Addition & Subtraction	Multiplication & Division

Suggested Sequence	• Explore hundreds
	• Numbers to 1000
	  ○ Represent on a PV grid
	• 100s, 10s and 1s
	• Number lines to 1000
	• Find 1, 10 and 100 more or less
	• Compare objects
	• Compare numbers
	• Order numbers
	  • Count in 50s
		• Add and subtract multiples of 100
		• Add and subtract 3-digit and 1-digit numbers – not crossing 10
		• Add 3-digit and 1-digit numbers - crossing 10
		• Subtract a 1-digit number from a 3-digit number – crossing 10
		• Add and subtract 3-digit and 2-digit numbers – not crossing 100
		• Add 3-digit and 2-digit numbers – crossing 100
		• Subtract a 2-digit number from a 3-digit number – crossing 100
		• Add and subtract 100s
		• Pattern spotting
		• Mixed addition and subtraction problems
		• Add and subtract 2-digit and 3-digit numbers – not crossing 10 or 100
		• Add two 3-digit numbers – not crossing 10 or 100
		• Add two 3-digit numbers – crossing 10 or 100
		
		• Subtract a 3-digit number from a 3-digit number - no exchange
		• Subtract a 3-digit number from a 3-digit number - exchange
		• Estimate answers to calculations
		• Check answers
			• Multiplication – equal groups
			• Multiply by 3
			• Divide by 3
			• The 3 times-table
			• Multiply by 4
			• Divide by 4
			• The 4 times-table
			• Multiply by 8
			• Divide by 8
			• The 8 times-table

End Point (NCETM Progression)	✓ count from 0 in multiples of 4, 8, 50 and 100	✓ add and subtract numbers mentally, including:
		  ○ a three-digit number and ones
		  ○ a three-digit number and tens
		  ○ a three-digit number and hundreds
			✓ count from 0 in multiples of 4, 8, 50 and 100
			✓ recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables

	✓ find 10 or 100 more or less than a given number ✓ compare and order numbers up to 1 000 ✓ identify, represent and estimate numbers using different representations ✓ read and write numbers up to 1 000 in numerals and in words ✓ recognise the place value of each digit in a three-digit number (hundreds, tens, ones)	✓ 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 ✓ solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	✓ write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods ✓ write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods ✓ estimate the answer to a calculation and use inverse operations to check answers ✓ 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 objects

Year 3 - Spring Term

Week	1	2	3	4	5	6	7	8	9	10	11	12
KIRF	Know doubles and halves of all whole numbers to 20. e.g. 12 doubled is 24 and 12 halved is 6.						Know all number bonds for100 using multiples of 5.					

	Multiplication & Division	Money	Statistics	Length & Perimeter	Fractions	Consolidation

Suggested Sequence	• Comparing statements
	• Related calculations
	• Multiply 2-digits by 1-digit – no exchange
	• Multiply 2-digits by 1-digit – with exchange
	• Divide 2-digits by 1 digit
	• Divide 100 int0 2, 4, 5 and 10 equal parts
	• Divide with remainders
	• Divide 2-digits by 1-digit – include remainders
	• Scaling
	• Problem solving (x and /)
		• Pounds & pence
		• Convert £ and p
		• Add money
		• Subtract money
		• Give change
			• Revisit tally charts
			• Pictograms
			  ○ Draw
			  ○ Interpret
			• Draw bar charts
			• Interpret bar charts
			• Draw and interpret tables
				• Measure length (cm and m)
				• Investigate equivalent lengths – m & cm
				• Investigate equivalent lengths – mm & cm
				• Compare lengths
				• Add lengths
				• Subtract lengths
				• Investigate perimeter
				• Measure perimeter
				• Calculate perimeter
					Recap Unit
					• *Wholes and parts*
					• *Recognise a half*
					• *Recognise a quarter*
					• *Find a quarter*
					• *Recognise a third*
					• *Find a third*
					• *Unit fractions*
					• *Non-unit fractions*
					• *Equivalence of a half and 2 quarters*
					• *Count in fractions*	

End Point (NCETM Progression)	✓ count from 0 in multiples of 4, 8, 50 and 100 ✓ 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 that they know, including	✓ add and subtract amounts of **money** to give change, using both £	✓ interpret and present data using bar charts, pictograms and tables ✓ solve one-step and two-step questions [e.g. 'How many more?' and 'How	✓ measure, compare, add and subtract: **lengths** (m/cm/mm); **mass** (kg/g); **volume/capacity** (l/ml) ✓ measure the **perimeter** of simple 2-D shapes	✓ count up and down in tenths ✓ recognise, find and write fractions of a discrete set of objects: unit fractions and non-	

	for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods ✓ write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods ✓ estimate the answer to a calculation and use inverse operations to check answers ✓ 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 objects	and p in practical contexts	many fewer?'] using information presented in scaled bar charts and pictograms and tables.		unit fractions with small denominators ✓ recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10. ✓ recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators ✓ compare and order unit fractions, and fractions with the same denominators ✓ recognise and show, using diagrams, equivalent fractions with small denominators ✓ add and subtract fractions with the same denominator within one whole (e.g. $^5/_7 + {}^1/_7 = {}^6/_7$)	

Year 3 - Summer Term

Week	1	2	3	4	5	6	7	8	9	10	11	12
KIRF	**Know all multiplication and division facts for the 3,6 and 9 times tables.**						**Know all multiplication and division facts for 2x,5x and 10x table. (instant recall)**					

	Fractions	Time	Shape	Mass & Capacity	Consolidation
Suggested Sequence	• Making the whole • Explore tenths • Count in tenths • Tenths as decimals • Fractions on a number line • Fractions of a set of objects • Equivalent fractions • Compare fractions • Order fractions • Add fractions • Subtract fractions	• Months and years • Hours in a day • Telling the time to 5 minutes • Telling the time to the minute • Using am and pm • Investigate the 24-hour clock • Finding durations • Comparing durations • Start and end times • Measuring time in seconds • Problem solving with time	• Turns and angles • Right angles in shapes • Compare angles • Draw accurately • Horizontal and vertical • Parallel and perpendicular • Recognise and describe 2D shapes • Recognise and describe 3D shapes • Make 3D shapes	• Measure mass • Compare mass • Add and subtract mass • Measure capacity • Compare capacity • Add and subtract capacity • Investigate and explore temperature	
End Point (NCETM Progression)	✓ count up and down in tenths ✓ recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators ✓ recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10.	✓ tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks ✓ estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary	✓ draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them	✓ measure, compare, add and subtract: **lengths** (m/cm/mm); **mass** (kg/g); **volume/capacity** (l/ml)	

	✓ recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators ✓ compare and order unit fractions, and fractions with the same denominators ✓ recognise and show, using diagrams, equivalent fractions with small denominators ✓ add and subtract fractions with the same denominator within one whole (e.g. $^5/_7 + {}^1/_7 = {}^6/_7$)	such as 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	✓ recognise angles as a property of shape or a description of a turn ✓ identify right angles, recognise that two right angles make a half-turn, 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		

Year 4 - Autumn Term

Week	1	2	3	4	5	6	7	8	9	10	11	12
KIRF	Know all number bonds for 100.						**Know multiplication and division facts for 7x table.**					
	Place Value				Addition & Subtraction			Length & Perimeter		Multiplication & Division		
Suggested Sequence	• Round to the nearest 10 • Round to the nearest 100 • Count in 1000s • Represent numbers to 10,000 • 1000 more or less • Compare 4-digit numbers • Order numbers • Round to the nearest 1000 • Count in 25s • Negative numbers • Roman Numerals				• Add and subtract 1s, 10s, 100s and 1000s • Add two 4-digit numbers - no exchange • Add two 4-digit numbers - one exchange • Add two 4-digit numbers – more than one exchange • Subtract two 4-digit numbers - no exchange • Subtract two 4-digit numbers – one exchange • Subtract two 4-digit numbers – more than one exchange • Explore efficient methods for subtraction • Estimate answers • Checking strategies (including inverse)			• Kilometres • Perimeter on a grid • Perimeter of a rectangle • Perimeter of rectilinear shapes		• Multiply by 10 • Multiply by 100 • Divide by 10 • Divide by 100 • Multiply by 1 and 0 • Divide by 1 and itself • Multiply and divide by 6 • 6 times table and related division facts • Multiply and divide by 9 • 9 times table and related division facts • Multiply and divide by 7 • 7 times table and related division facts	

End Point (NCETM Progression)	✓ count backwards through zero to include negative numbers ✓ count in multiples of 6, 7, 9, 25 and 1 000 ✓ find 1 000 more or less than a given number ✓ order and compare numbers beyond 1 000 ✓ compare numbers with the same number of decimal places up to two decimal places ✓ identify, represent and estimate numbers using different representations ✓ 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. ✓ recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) ✓ find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as units, tenths and hundredths ✓ round any number to the nearest 10, 100 or 1 000 ✓ solve number and practical problems that involve all of the above and with increasingly large positive numbers	✓ 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	✓ measure and calculate the **perimeter** of a rectilinear figure (including squares) in centimetres and metres ✓ find the area of rectilinear shapes by counting squares ✓ convert between different units of measure (e.g. kilometre to metre; hour to minute)	✓ count in multiples of 6, 7, 9, 25 and 1 000 ✓ recall multiplication and division facts for multiplication tables up to 12 × 12 ✓ 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 ✓ recognise and use factor pairs and commutativity in mental calculations ✓ estimate and use inverse operations to check answers to a calculation ✓ 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

Year 4 - Spring Term

Week	1	2	3	4	5	6	7	8	9	10	11	12
KIRF	Know all pairs of multiples of 50 with a total of 1000 e.g. 350 + 650 = 1000.						Know the decimal equivalents of the fractions ½, ¼, ¾, ⅓, ⅔, 1/10 and ⅕.					
	Multiplication & Division			Area		Fractions			Decimals			Consolidation
Suggested Sequence	• 11- and 12-times table • Multiply 3 numbers • Factor pairs • Efficient multiplication • Written methods • Multiply 2 digits by 1 digit • Multiply 3 digits by 1-digit • Divide 2-dgits by 1-digit • Divide 3-digits by 1-digit • X & / problem solving			• What is area? • Counting squares • Making shapes • Comparing area		• What is a fraction • Equivalent fractions • Fractions greater than 1 • Count in fractions • Add 2 or more fractions • Subtract 2 fractions • Subtract from whole amounts • Calculate fractions of a quantity • Fraction problem solving			• Recognise tenths and hundredths • Tenths as decimals • Tenths on a place value gird • Tenths on a number line • Divide 1-digit by 10 • Divide 2-digits by 10 • Hundredths • Hundredths as decimals • Hundredths on a place value gird • Divide 1 or 2-digits by 100		
End Point (NCETM Progression)	✓ count in multiples of 6, 7, 9, 25 and 1 000 ✓ recall multiplication and division facts for multiplication tables up to 12 × 12 ✓ use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing			✓ find the area of rectilinear shapes by counting squares		✓ count up and down in hundredths ✓ recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten ✓ recognise and show, using diagrams, families of common equivalent fractions ✓ recognise and write decimal equivalents of any number of tenths or hundredths ✓ recognise and write decimal equivalents to $^1/_4$; $^1/_2$; $^3/_4$			✓ compare numbers with the same number of decimal places up to two decimal places ✓ round decimals with one decimal place to the nearest whole number ✓ recognise and write decimal equivalents of any number of tenths or hundredths		

	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 ✓ recognise and use factor pairs and commutativity in mental calculations ✓ estimate and use inverse operations to check answers to a calculation ✓ 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		✓ 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 ✓ solve simple measure and money problems involving fractions and decimals to two decimal places.	✓ recognise and write decimal equivalents to $^1/_4$; $^1/_2$; $^3/_4$ ✓ find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths ✓ solve simple measure and money problems involving fractions and decimals to two decimal places.	

Year 4- Summer Term

Week	1	2	3	4	5	6	7	8	9	10	11	12
KIRF	**Know multiplication and division fact for 11x and 12x table.**						Know all number bonds for £1 using decimal notation.					
	Decimals		Money		Time		Statistics	Shape			Position & Direction	Consolidation
Suggested Sequence	• Make a whole • Write decimals • Compare decimals • Order decimals • Round decimals • Halves and quarters		• Pounds and pence • Ordering money • Estimating money • Working with money • Four operations involving money		• Hour, minutes and seconds • Years, months, weeks and days • Analogue to digital ○ 12 hour ○ 24 hour		• Interpret charts • Comparison, sum and difference • Line graphs	• Identify angles • Compare and order angles • Explore triangles • Explore quadrilaterals • Symmetry • Lines of symmetry • Draw lines of symmetry			• Describe position • Draw on a grid • Move on a grid • Describe movement	
End Point (NCETM Progression)	✓ compare numbers with the same number of decimal places up to two decimal places ✓ round decimals with one decimal place to the nearest whole number ✓ recognise and write decimal		✓ estimate, compare and calculate different measures, including money in pounds and pence		✓ read, write and convert time between analogue and digital 12 and 24-hour clocks ✓ read, write and convert time between analogue and digital 12 and 24-hour clocks ✓ solve problems involving converting from		✓ interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	✓ identify lines of symmetry in 2-D shapes presented in different orientations ✓ complete a simple symmetric figure with respect to a specific line of symmetry ✓ compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes			✓ describe positions on a ✓ 2-D grid as coordinates in the first quadrant ✓ describe movements between positions as translations	

	equivalents of any number of tenths or hundredths ✓ recognise and write decimal equivalents to $^1/_4$; $^1/_2$; $^3/_4$ ✓ find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths ✓ solve simple measure and money problems involving fractions and decimals to two decimal places.		hours to minutes; minutes to seconds; years to months; weeks to days	✓ solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.	✓ identify acute and obtuse angles and compare and order angles up to two right angles by size	of a given unit to the left/right and up/down ✓ plot specified points and draw sides to complete a given polygon	

Year 5- Autumn Term

Week	1	2	3	4	5	6	7	8	9	10	11	12
KIRF	Know all decimals that total 1 or 10 (decimal place) e.g. 0.3 + 0.7 = 1 and 6.2 + 3.8 = 10.						**Consolidate all multiplication and division facts for all tables.**					
	Place Value			Addition & Subtraction		Statistics		Multiplication & Division			Perimeter & Area	
Suggested Sequence	• Numbers to 10,000 • Rounding to 10, 100 and 1000 • Numbers to 100,000 • Compare and order numbers to 100,000 • Round numbers within 100,000 • Numbers to a million • Count in 10s, 100s, 1000s, 10,000s and 100,000s • Compare and order numbers to one million • Round numbers to one million • Negative numbers • Roman numerals			• Add whole numbers with more than 4-digits (standard method) • Subtract whole numbers with more than 4-digits (standard method) • Round to estimate and approximate • Inverse operations • Multi-step problem solving		• Read and interpret line graphs • Draw line graphs • Use line graphs to solve problems • Read and interpret tables • Two-way tables • Timetables		• Explore multiples • Explore factors • Common factors • Prime numbers • Square numbers • Cube numbers • Multiply by 10, 100 and 1000 • Divide by 10, 100 and 1000 • Multiples of 10, 100 and 1000		• Measure perimeter • Calculate perimeter • Area of rectangles • Area of compound shapes • Area of irregular shapes	
End Point (NCETM Progression)	✓ interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero			✓ add and subtract numbers mentally with increasingly large numbers		✓ complete, read and interpret information in		✓ count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000			✓ calculate and compare the area of squares and rectangles including using standard units,	

	✓ 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, 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. ✓ read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit ✓ round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000	✓ 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	tables, including timetables ✓ solve comparison, sum and difference problems using information presented in a line graph	✓ 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 (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 (^{2}) and cubed (^{3}) ✓ solve problems involving multiplication and division including using their knowledge of	square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes (also included in measuring) ✓ 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, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes

				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	

Year 5 - Spring Term												
Week	1	2	3	4	5	6	7	8	9	10	11	12
KIRF	Know the doubles and halves of all two digit numbers.						Know the prime numbers up to 100.					
	Multiplication & Division			Fractions						Decimals & Percentages		Consolidation
Suggested Sequence	• Multiply 4-digits by 1-digit • Multiply 2-digits (area of model) • Multiply 2-digits by 2-digits • Multiply 3-digits by 2-digits • Multiply 4-digits by 2-digits • Divide 4-digits by 1-digit • Divide with remainders			• Equivalent fractions • Improper fractions to mixed numbers • Mixed numbers to improper fractions • Number sequences • Compare and order fractions less than 1 • Compare and order fractions greater than 1 • Add and subtract fractions						• Decimals up to 2 d.p • Decimals as fractions • Understand thousandths • Thousandths as decimals • Rounding decimals		

		• Add fractions within 1 • Add 3 or ore fractions • Add fractions • Add mixed numbers • Subtract fractions • Subtract mixed numbers • Subtraction – breaking the whole • Subtract 2 mixed numbers • Multiply unit fractions by an integer • Multiply non-unit fractions by an integer • Multiply mixed numbers by integers • Fractions of an amount • Using fractions as operators • Fraction problem solving	• Order and compare decimals • Understanding percentages • Percentages as fractions and decimals • Equivalent F.D.P	
End Point (NCETM Progression)	✓ count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 ✓ 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	✓ recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents ✓ compare and order fractions whose denominators are all multiples of the same number ✓ 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 = $^{71}/_{100}$) ✓ 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 > 1 as a mixed number (e.g. $^{2}/_{5} + {}^{4}/_{5} = {}^{6}/_{5} = 1^{1}/_{5}$) ✓ multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	✓ recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents ✓ read and write decimal numbers as fractions (e.g. 0.71 = $^{71}/_{100}$) ✓ recognise the per cent symbol (%) and understand that per cent relates to “number of parts per hundred”, and write percentages as a fraction with	

	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 (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 (^{2}) and cubed (^{3}) ✓ 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		denominator 100 as a decimal fraction ✓ solve problems involving numbers up to three decimal places ✓ solve problems which require knowing percentage and decimal equivalents of $^1/_2$, $^1/_4$, $^1/_5$, $^2/_5$, $^4/_5$ and those with a denominator of a multiple of 10 or 25.	

Year 5 - Summer Term

Week	1	2	3	4	5	6	7	8	9	10	11	12
KIRF	Know all pairs of factors of numbers up to 100.						Know the decimal and percentage equivalents of ½, ¼, ¾, ⅓, ⅔, 1/10 and ⅕.					
	Consolidation	Decimals			Shape			Position & Direction		Converting Units		Volume
Suggested Sequence		• Adding decimals within 1 • Subtracting decimals within 1 • Complements to 1 • Adding decimals – crossing the whole • Adding decimals with the same number of decimal places • Subtracting decimals with the same number of decimal places • Problem solving adding and subtracting decimals with the same number of decimal places • Adding decimals with a different number of decimal places • Subtracting decimals with a different number of decimal places • Problem solving adding and subtracting decimals with a different number of decimal places			• Measure angles in degrees • Measuring with a protractor • Drawing lines and angles accurately • Calculating angles on a straight line • Calculating angles around a point • Calculating lengths and angles in shapes • Regular and irregular polygons • Reasoning about 3D shapes			• Position in the first quadrant • Translation • Translation with coordinates • Reflection • Reflection with coordinates		• Kilograms and kilometres • Millimetres and millilitres • Metric units • Imperial units • Converting units of time • Timetables		• What is volume? • Compare volume • Estimate volume • Estimate capacity

		• Adding and subtracting wholes and decimals • Decimal sequences • Multiply decimals by 10, 100 and 1000 • Divide decimals by 10, 100 and 1000				
End Point (NCETM Progression)		✓ recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents ✓ read and write decimal numbers as fractions (e.g. 0.71 = $^{71}/_{100}$) ✓ 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 ✓ solve problems involving numbers up to three decimal places ✓ solve problems which require knowing percentage and decimal equivalents of $^{1}/_{2}$, $^{1}/_{4}$, $^{1}/_{5}$, $^{2}/_{5}$, $^{4}/_{5}$ and those with a denominator of a multiple of 10 or 25.	✓ identify 3-D shapes, including cubes and other cuboids, from 2-D representations ✓ 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 one whole turn (total 360°) ○ angles at a point on a straight line and ½ a turn (total 180°)	✓ 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	✓ convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) ✓ 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	✓ estimate volume (e.g. using 1 cm^3 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

			○ other multiples of 90°			decimal notation including scaling.

Year 6 - Autumn Term

Week	1	2	3	4	5	6	7	8	9	10	11	12
KIRF	Know all previous learnt number bonds (including decimals)						Derive multiplication and division facts using decimal numbers e.g. 8 x 7 = 56 so 8 x 0.7 = 5.6.					

	Place Value	Four Operations	Fractions	Position

Suggested Sequence	• Numbers to 10 million
	• Compare and order any numbers
	• Round any number
	• Negative numbers
		• Add and subtract integers
		• Multiply up to a 4-digit number by a 2-digit number
		• Short division
		• Division using factors
		• Long division
		• Common factors
		• Common multiples
		• Primes to 100
		• Squares and cubes
		• Order of operations
		• Mental calculations and estimation
		• Reason from known facts
			• Simplify fractions
			• Fractions on a number line
			• Compare and order
			  ○ Denominator
			  ○ Numerator
			• Add and subtract fractions
			• Mixed addition and subtraction
			• Multiply fractions by integers
			• Multiply fractions by fractions
			• Divide fractions by integers
			• Four rules with fractions
			• Fractions of an amount
			• Fractions of an amount – find the whole
				• 1st quadrant
				• 4 quadrants
				• Translations
				• Reflections

End Point (NCETM Progression)	✓ use negative numbers in context, and calculate intervals across zero	✓ perform mental calculations, including with mixed operations and large numbers ✓ use their knowledge of the order of operations to carry out calculations involving the four operations	✓ compare and order fractions, including fractions >1 ✓ use common factors to simplify fractions; use common multiples to express fractions in the same denomination ✓ recall and use equivalences between simple fractions, decimals and	✓ describe positions on the full coordinate grid (all four quadrants)

	✓ read, write, order and compare numbers up to ✓ 10 000 000 and determine the value of each digit ✓ identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and ✓ 1 000 where the answers are up to three decimal places ✓ round any whole number to a required degree of accuracy ✓ solve problems which require answers to be rounded to specified degrees of accuracy	✓ use estimation 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 ✓ Solve problems involving addition, subtraction, multiplication and division ✓ perform mental calculations, including with mixed operations and large numbers ✓ multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication ✓ divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context ✓ identify common factors, common multiples and prime numbers ✓ use their knowledge of the order of operations to carry out calculations involving the four operations ✓ use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy	percentages, including in different contexts. ✓ add and subtract fractions with different denominators and mixed numbers, using the ✓ concept of equivalent fractions ✓ multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $^1/_4 \times {}^1/_2 = {}^1/_8$) ✓ divide proper fractions by whole numbers (e.g. $^1/_3 \div 2 = {}^1/_6$)	✓ draw and translate simple shapes on the coordinate plane, and reflect them in the axes.

Year 6 - Spring Term

Week	1	2	3	4	5	6	7	8	9	10	11	12
KIRF	Know the doubles and halves of all two digit decimals.						Know all the square numbers to 12 x 12.					
	Decimals		Percentages		Algebra		Comparing Units	Perimeter, Area & Volume		Ratio		Consolidation
Suggested Sequence	• Three decimal places • Multiply by 10, 100 and 1000 • Divide by 10, 100 and 1000 • Multiply decimals by integers • Divide decimals by integers • Division to solve problems • Decimals as fractions • Fraction to decimals		• Fractions to percentages • Equivalent FDP • Order FDP • Percentage of an amount • Percentages – missing values		• Find a rule - one step • Find a rule – two step • Forming expressions • Substitution • Formulae • Forming equations • Solve simple one-step equations • Solve two-step equations • Find pairs of values		• Metric measures • Convert metric measures • Calculate with metric measures • Miles and kilometres • Imperial measures	• Shapes – same area • Investigate area and perimeter • Area of a triangle • Area of a parallelogram • Volume - counting cubes • Volume of a cuboid		• Use ratio language • Ratio and fractions • Introducing the ratio symbol • Calculating ratio • Using scale factors • Ratio and proportion problems	
End Point (NCETM Progression)	✓ identify the value of each digit in numbers given to three decimal places ✓ solve problems which require		✓ recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.		✓ express missing number problems algebraically ✓ find pairs of numbers that satisfy number sentences		✓ solve problems involving the calculation and conversion of **units of measure**, using decimal	✓ calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed		✓ solve problems involving the relative sizes of two quantities where missing values can be found by using		

	answers to be rounded to specified degrees of accuracy ✓ associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^3/_8$) ✓ recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. ✓ multiply one-digit numbers with up to two decimal places by whole numbers ✓ multiply one-digit numbers with up to two decimal places by whole numbers ✓ multiply and divide numbers by 10, 100 and 1000 where the answers	✓ associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^3/_8$)	involving two unknowns ✓ enumerate all possibilities of combinations of two variables ✓ use simple formulae ✓ generate and describe linear number sequences	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 three decimal places ✓ convert between miles and kilometres	(cm^3) and cubic metres (m^3), and extending to other units such as mm^3 and km^3. ✓ recognise that shapes with the same areas can have different **perimeters** and vice versa ✓ calculate the area of parallelograms and triangles ✓ calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [e.g. mm^3 and km^3]. ✓ recognise when it is possible to use formulae for area and volume of shapes	integer multiplication and division facts ✓ solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison ✓ 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.	

	are up to three decimal places ✔ identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 ✔ and 1000 where the answers are up to three decimal places ✔ associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^3/_8$) ✔ use written division methods in cases where the answer has up to two decimal places						

Year 6 - Summer Term												
Week	1	2	3	4	5	6	7	8	9	10	11	12
KIRF	Know the square roots of all numbers to 15 x 15.						Find a percentage of an amount and reduce by a percentage.					
	Statistics		Shape			Consolidation & Wider Problem Solving/Enrichment						
Suggested Sequence	• Read and interpret line graphs • Draw line graphs • Use line graphs to solve problems • Circles • Read and interpret pie charts • Pie charts with percentages • Draw pie charts • Find the mean		• Measure with a protractor • Introduce angles • Calculate angles • Vertically opposite angles • Angles in a triangle • Angles in quadrilaterals • Angles in regular polygons • Draw shapes accurately • Draw nets of 3D shapes									
End Point (NCETM Progression)	✓ interpret and construct pie charts and line graphs and use these to solve problems ✓ calculate and interpret the mean as an average		✓ recognise, describe and build simple 3-D shapes, including making nets ✓ illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius ✓ draw 2-D shapes using given dimensions and angles									

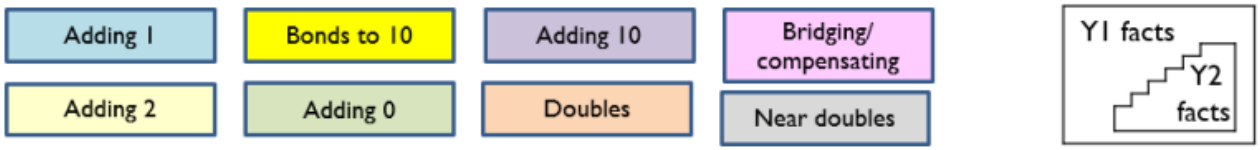
		✓ recognise, describe and build simple 3-D shapes, including making nets ✓ compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons ✓ recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles	

Key Instant Recall Facts (KIRFs) at Chacewater

The table below outlines KIRFs that should be learnt with regular daily practice, in addition to the normal maths lesson. Often this may be part of the routine first thing in the morning. **Times Tables Expectations in red and there should be daily practice ongoing of these.**

	R	Y1	Y2	Y3	Y4	Y5	Y6
Autumn 1	Know and say the numbers from 0 to 5 and back from 5 to 0.	Know all number bonds for 5.	Know all number bonds for 10 and 20.	Know all the number bonds for each number to 20 e.g. 13+6 = 19	Know all number bonds for 100.	Know all decimals that total 1 or 10 (decimal place) e.g. 0.3 + 0.7 = 1 and 6.2 + 3.8 = 10.	Know all previous learnt number bonds (including decimals)
Autumn 2	Know and say the numbers from 0 to 10 and back from 10 to 0.	Know all number bonds for 10.	**Know multiplication and division facts for 2x table.**	**Know multiplication and division facts for 2x, 4x and 8x table.**	**Know multiplication and division facts for 7x table.**	**Consolidate all multiplication and division facts for all tables.**	Derive multiplication and division facts using decimal numbers e.g. 8 x 7 = 56 so 8 x 0.7 = 5.6.
Spring 1	Know how to partition numbers to 5 into two groups.	Know all number bonds for 20.	**Know multiplication and division facts for 10x table.**	Know doubles and halves of all whole numbers to 20. e.g. 12 doubled is 24 and 12 halved is 6.	**Know multiplication and division fact for 11x and 12x table.**	Know the doubles and halves of all two digit numbers.	Know the doubles and halves of all two digit decimals.
Spring 2	Know how to partition numbers to 10 into two groups.	Know all doubles and halves of even number to 20.	Know the halves of 1,3,5,7,9 e.g. half of 3 is 1 ½	Know all number bonds for100 using multiples of 5.	Know all pairs of multiples of 50 with a total of 1000 e.g. 350 + 650 = 1000.	Know the prime numbers up to 100.	Know all the square numbers to 12 x 12.
Summer 1	Be able to read and write numbers to 20.	Know all addition and subtraction facts for all numbers between 0 and 10.	Know all addition and subtraction facts for multiples of 10 to 100.	**Know all multiplication and division facts for the 3,6 and 9 times tables.**	Know the decimal equivalents of the fractions ½, ¼, ¾, ⅓, ⅔, 1/10 and ⅕.	Know all pairs of factors of numbers up to 100.	Know the square roots of all numbers to 15 x 15.
Summer 2	Be able to add and subtract single digit numbers by counting on or back.	Count forwards and backwards in steps of 2,5 and 10.	**Know multiplication and division facts for 5x table.**	**Know all multiplication and division facts for 2x,5x and 10x table. (instant recall)**	Know all number bonds for £1 using decimal notation.	Know the decimal and percentage equivalents of ½, ¼, ¾, ⅓, ⅔, 1/10 and ⅕.	Find a percentage of an amount and reduce by a percentage.
End of year		**By the end of Y2, through regular daily practice, all children should be achieving automaticity with known number facts. See table below.**			**All multiplication facts. Making use of the 21 facts and commutativity.**		

Number Facts to be Know by the end of KS1



+	0	1	2	3	4	5	6	7	8	9	10
0	0 + 0	0 + 1	0 + 2	0 + 3	0 + 4	0 + 5	0 + 6	0 + 7	0 + 8	0 + 9	0 + 10
1	1 + 0	1 + 1	1 + 2	1 + 3	1 + 4	1 + 5	1 + 6	1 + 7	1 + 8	1 + 9	1 + 10
2	2 + 0	2 + 1	2 + 2	2 + 3	2 + 4	2 + 5	2 + 6	2 + 7	2 + 8	2 + 9	2 + 10
3	3 + 0	3 + 1	3 + 2	3 + 3	3 + 4	3 + 5	3 + 6	3 + 7	3 + 8	3 + 9	3 + 10
4	4 + 0	4 + 1	4 + 2	4 + 3	4 + 4	4 + 5	4 + 6	4 + 7	4 + 8	4 + 9	4 + 10
5	5 + 0	5 + 1	5 + 2	5 + 3	5 + 4	5 + 5	5 + 6	5 + 7	5 + 8	5 + 9	5 + 10
6	6 + 0	6 + 1	6 + 2	6 + 3	6 + 4	6 + 5	6 + 6	6 + 7	6 + 8	6 + 9	6 + 10
7	7 + 0	7 + 1	7 + 2	7 + 3	7 + 4	7 + 5	7 + 6	7 + 7	7 + 8	7 + 9	7 + 10
8	8 + 0	8 + 1	8 + 2	8 + 3	8 + 4	8 + 5	8 + 6	8 + 7	8 + 8	8 + 9	8 + 10
9	9 + 0	9 + 1	9 + 2	9 + 3	9 + 4	9 + 5	9 + 6	9 + 7	9 + 8	9 + 9	9 + 10
10	10 + 0	10 + 1	10 + 2	10 + 3	10 + 4	10 + 5	10 + 6	10 + 7	10 + 8	10 + 9	10 + 10

[Times Tables - 21 Facts to be known by the end of Y4]