MATHS

INTENT

At The Queenswell Federation, we want all children to enjoy Maths and experience success in this subject. We believe that all children can achieve in Mathematics and aim to develop a growth mindset in our children so that they are not afraid to take risks and understand the value of making mistakes. Our aim is to develop enthusiastic, competent and articulate mathematicians, who are fluent in the fundamentals of mathematics, able to solve problems and reason mathematically.

Through the teaching of Maths, we intend to develop in our children:

- A love of mathematics
- The ability to think logically and work systematically in order to solve problems
- The ability to make connections across the areas of Maths and other subjects
- Number sense, through the modelling of different methods and using different representations to deepen children's understanding
- The ability to work both independently and in cooperation with others
- Their mathematical vocabulary, so that pupils are able to reason confidently
- A growth mindset - so that children are able to recognise and understand the value of mistakes and have a can- do, risk-taking attitude to their learning in Maths
- A secure, long term, deep and adaptable understanding of Maths, that they are able to apply in different contexts

IMPLEMENTATION

We implement our approach through high quality teaching, delivering appropriately challenging work for all children in the class.

Our lessons

Every class in Key Stage 1 and Key Stage 2 follows the White Rose Scheme of learning, which is aligned to the National Curriculum. This ensures that teaching methods and practice are consistent across the school, and that children have the opportunity to develop their fluency, problem solving and reasoning in each lesson.

Lessons are designed to follow a teaching for mastery approach, which promotes deep understanding and achievement for all. This means that children are not ability grouped, but work in mixed ability pairs to discuss methods and reason mathematically. We have a range of mathematical resources that are used in lessons (such as Base 10, Numicon, numberlines and counters), to support the CPA (concrete, pictorial, abstract)

approach. When a concept is initially introduced it is represented using equipment (concrete). Once the children have grasped a concept using resources, images and diagrams are used (pictorial) prior to moving onto written calculations or problems (abstract). This approach ensures that children understand a concept in depth. Extensions and challenges are provided for those children who have achieved an objective, and these are designed to deepen their understanding through problem solving and reasoning rather than moving children onto the next objective. This way all children progress through the year group objectives at the same pace.

In lessons, mistakes are valued and teachers are aware of the language that they use so that they are always promoting a growth and not fixed mindset.

Online Maths Tools
In order to advance children's maths skills in school and at home, we utilise Times Tables Rockstars in Years 2-6, for multiplication and division practise, application and consolidation.

Assessment
We continuously monitor pupil's progress within and across lessons and will target those children who need extra support in fluid, teacher or TA led groups either within the lesson or as an intervention before the next.

Summative assessments are completed every term and their results form discussions in Pupil Progress meetings. Teacher's use the White Rose Assessments, along with their own knowledge of the children, to inform these assessments and the progress of each child is also recorded. This ensures that teachers are providing provision for every child and can adapt their planning and teaching accordingly.

LINKS TO EYFS

Mathematics

Intent

It is essential for children to develop a *strong understanding of number* in order to develop the necessary building blocks to excel mathematically. We aim to provide an environment that allows children frequent and varied daily opportunities to use their understanding of number in real life-contexts. We intend to provide children with the secure base of knowledge and vocabulary that they will need to master mathematics. It is also important that there are rich opportunities for children to develop *spatial reasoning skills* across areas including *shape, space and measure;* and to develop positive attitudes and interests in maths; look for patterns and relationships; spot connections; 'have a go'; talk about what they notice; and not be afraid to make mistakes.

Implementation

We provide a *mathematically challenging* environment. This includes:

- a *number-rich environment* – number lines and other visuals showing the correlation between numerals and quantities.
- a range of loose part manipulatives available as part of continuous provision such as pebbles and tens frames for organising counting.
- Daily opportunities to practice counting and understanding of number e.g. counting children at register, sharing and sorting equipment, fruit and/or milk.
- Maths mastery scheme of work – White Rose Maths (in Reception).
- Resources and activities suggested by NRICH.
- Block areas in all year groups with varying degrees of challenge to help develop spatial reasoning skills and mathematical language around shape, space and measure.
- *Mathematical vocabulary rich* environment - vocab words, explicit questions and challenges displayed and referred to throughout continuous provision.
- Adults understand the 5 counting principles.

YEAR 1

Strand	Intent (Learning Questions)	Implementation (Skills Progression & Activities, **Reading +** *Vocabulary*)
Autumn Block 1 **Number: Place Value (within 10)** **Small steps:** • Sort objects. • Count objects. • Represent objects. • Count, read and write forwards from any number 0 to 10. • Count, read and writing backwards	• Count to ten, forwards and backwards, beginning with 0 or 1, or from any given number. • Count, read and write numbers to 10 in numerals and words. • Given a number, identify one more or one less. • Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least.	**Skills:** children begin to read and write numbers to ten in and out of sequence They learn the value of single digit numbers in real life and through direct teaching **Vocabulary:** number, numeral, digit, ones, tens, place value chart, partition, same, different, object, sort, group, set, count, numbers to 100, last, before, how many…? more, less, fewer, count on, forwards, backwards, bigger, smaller, pattern, match, greater than, less than, equal to, symbol, greatest, fewest, most, least, order, numberline, jumps, representation, part-whole, bar model **Suggested activities:** **Fluency:** • Represent numbers on a washing line / with groups of objects • Match the numbers to the correct amount on request • place numbers on a number line • count how many there are in each group. • Arrange piles of objects in order • count forwards and backwards within ten

from any number 0 to 10. • Count one more. • Count one less. • One to one correspondence to start to compare groups. • Compare groups using language such as equal, more/greater, less/fewer. • Introduce =, > and < symbols. • Compare numbers. • Order groups of objects. • Order numbers. • Ordinal numbers (1st, 2nd, 3rd ….) • The number line.		• Complete number sentences using < > or = **Problem solving:** • can you show me fewer than 4 sweets? • find consecutive and non-consecutive missing numbers in sequences. • sort and compare objects into groups and say why using mathematical vocabulary **Reasoning:** • Odd one out /Same or different • Which representation is correct? Say how you know.
Autumn Block 2 **Number: Addition and Subtraction (within 10)** **Small steps:** • Add by counting on. • Find and make number bonds. • Add by making 10. • Subtraction –Not crossing 10. • Subtraction – Crossing 10 (1). • Subtraction – Crossing 10 (2). • Related Facts.	• Represent and use number bonds and related • subtraction facts within 10. • Read, write and interpret mathematical statements involving addition (+), subtraction ((--) and equals (=) signs. • Add and subtract one-digit numbers to 10, including zero. • Solve one step problems that involve addition and subtraction, using concrete objects and pictorial representations and missing number problems.	**Skills**: Pupils memories and reason with number bonds to 10 and 20 in several forms (for example, 9 + 7 = 16; 16 – 7 = 9; 7 = 16 – 9). They should realize the effect of adding or subtracting zero. This establishes addition and subtraction as related operations. Pupils combine and increase numbers, counting forwards and backwards. They discuss and solve problems in familiar practical contexts, including using quantities. Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly. **Vocabulary:** whole, part, part-whole model, partition, addition, plus, add, more, total, equal to, calculation, number sentence, fact families, number bonds, counting on, altogether, subtraction, take away, 'how many left..?' count back, difference, commutative, method, inverse, compare **Suggested activities**: See Queenswell Calculation Policy **Fluency:**

• Compare Number Sentences.		• Represent addition and subtraction in part-whole models and bar models • Make, draw and write CPA • Number Lines and subtraction counting back • Missing numbers in calculations • Introduce formal written methods • Learning fact families • Add and subtract **Problem solving**: • Finding a part find a part by breaking apart – find the difference • Which model represents this problem? • Find all possible solutions • One step problem with addition and subtraction • Write a word problem for a number sentence or bar model **Reasoning:** • Compare number bonds • Reason with number bonds • Find systematic methods for number bonds within ten
Autumn Block 3 **Geometry: Shape** **Small steps:** • Recognise and name 3D shapes. • Sort 3D shapes. • Recognise and name 2D shapes. • Sort 2D shapes. • Patterns with 3D and 2D shapes.	• Recognize and name 3D shapes. • Sort 3D shapes. • Recognise and name 2D shapes. • Sort 2D shapes. • Patterns with 3D and 2D shapes	**Skills:** Pupils handle common 2-D and 3-D shapes, naming these and related everyday objects fluently. They recognise these shapes in different orientations and sizes, and know that rectangles, triangles, cuboids and pyramids are not always similar to each other **Vocabulary: Group**, 3D shape (three dimensional), cuboid, cube, cylinder, pyramid, cone, sphere, type size, colour, roll stack, curved, flat, sort, 2D shapes, rectangle, circle, square, triangle, straight lines **Suggested activities:** **Fluency:** • Lotto games • Shape hunt around the school 2d/ 3d shapes • Build your own model using 3-D shapes and ask a partner to describe it. **Problem solving**: • The bottom of a 3-D shape is hidden. What shape could it be? Explain how you know. • Circle the odd one out in each group. • Which shapes will roll? Circle them. • Which shapes with stack? **Reasoning:** • Does the shape change when we turn it around?

		• Can you think of any everyday objects that are cones? Can you • think of any everyday objects that are cubes? Can you think of any everyday objects that are …?
Autumn Block 4 **Weeks 10-12** **Number: Place Value (within 20)** **Small steps:** • *Count forwards and backwards and write numbers to 20 in numerals and words.* • *Numbers from 11 to 20.* • *Tens and ones.* • *Count one more and one less.* • *Compare groups of objects.* • *Compare numbers.* • *Order groups of objects.* • *Order numbers*	• Count to twenty, forwards and backwards, beginning with 0 or 1, from any given number. • Count, read and write numbers to 20 in numerals and words. • Given a number, identify one more or one less. • Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least.	**Skills**: develop place value and number skills to 20. children Pupils begin to recognise place value in numbers to 20 by reading, writing, counting and comparing numbers. Children are building on their existing knowledge of counting forwards and backwards by introducing the numbers 11-20 Children should explore the meaning of the suffix 'teen' and what this tells us about a number. **Vocabulary:** number, numeral, digit, ones, tens, place value chart, partition, same, different, object, sort, group, set, count, numbers to 100, last, before, how many…? more, less, fewer, count on, forwards, backwards, bigger, smaller, pattern, match, greater than, less than, equal to, symbol, greatest, fewest, most, least, order, numberline, jumps, representation, part-whole, bar model **Suggested activities** **Fluency:** Partition two-digit numbers into different combinations of tens and ones, Represent numbers on a washing line / with groups of objects • Partition a two-digit number into tens and ones- dienes/ counters / numicon • Arrange piles of objects in order • count forwards and backwards within twenty **Reasoning:** **Problem solving**: • find consecutive and non-consecutive missing numbers in sequences. • Reasoning: Which representation is correct? Say how you know. • Explaining their thinking verbally, in pictures or using apparatus. • What does 'teen' tell us about a number?
Spring 1 block 1 **Number: Addition and subtraction (within 20)** **Small steps:** • Add by counting on. • Find and make number bonds. • Add by making 10. • Subtraction–Not	• read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs • represent and use number bonds and related subtraction facts within 20 • add and subtract one-digit and two-digit numbers to 20, including zero	**Skills**: Pupils memorise and reason with number bonds now to 20 in several forms (for example, 9 + 7 = 16; 16 – 7 = 9; 7 = 16 – 9). They should realise the effect of adding or subtracting zero. This establishes addition and subtraction as related operations. Pupils combine and increase numbers, counting forwards and backwards. They discuss and solve problems in familiar practical contexts, including using quantities. Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and

crossing 10. ● Subtraction– Crossing 10 (1). ● Subtraction– Crossing 10 (2). ● Related Facts. ● Compare-number Sentences.		less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly. **vocabulary**- reinforce addition and subtraction to 10 whole, part, part-whole model, partition, addition, plus, add, more, total, equal to, calculation, number sentence, fact families, number bonds, counting on, altogether, subtraction, take away, 'how many left..?' count back, difference, commutative, method, inverse, compare See Queenswell Calculation Policy **Activities** **Fluency:** ● Represent addition and subtraction in part-whole models and bar models ● Make, draw and write CPA ● Number Lines and subtraction counting back ● Missing numbers in calculations ● Add and subtract **Problem solving:** ● Finding a part find a part by breaking apart – find the difference ● Which model represents this problem? ● Find all possible solutions to a problem ● One step problems with addition and subtraction ● Solve and write word problems **Reasoning:** ● Find systematic methods for number bonds up to 20 ● How many more to make...? how many more is…than...? how much more is...? Subtract, take away, minus How many fewer is…than...? how much less is...?
Spring Block: Number: Place Value within 50 **Small steps:**	● Count to ten, forwards and backwards, beginning with 0 or 1, or from any given number. ● Count, read and write numbers to 10 in numerals and words.	**Skills**: Develop place value and number skills to 20. children Pupils begin to recognise place value in numbers to 20 by reading, writing, counting and comparing numbers Children are building on their existing knowledge of counting forwards and backwards by introducing the numbers 11-20 Children should explore the meaning of the suffix 'teen' and what this tells us about a number.

● Numbers to 50. ● Tens and ones. ● Represent numbers to 50. ● One more one less. ● Compare objects within 50. ● Compare numbers within 50. ● Order numbers within 50. ● Count in 2s. ● Count in 5s.	● Given a number, identify one more or one less. ● Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least.	**Vocabulary:** number, numeral, digit, ones, tens, place value chart, partition, same, different, object, sort, group, set, count, numbers to 100, last, before, how many…? more, less, fewer, count on, forwards, backwards, bigger, smaller, pattern, match, greater than, less than, equal to, symbol, greatest, fewest, most, least, order, numberline, jumps, representation, part-whole, bar model **Suggested activities** **Fluency** ● Partition two-digit numbers into different combinations of tens and ones, Represent numbers on a washing line / with groups of objects ● Partition a two-digit number into tens and ones- dienes/ counters / numicon ● Arrange piles of objects in order ● count forwards and backwards within twenty **Problem solving:** ● find consecutive and non-consecutive missing numbers in sequences. **Reasoning:** ● Which representation is correct? Say how you know. ● Explaining their thinking verbally, in pictures or using apparatus. ● What does 'teen' tell us about a number?
Spring Block 3 **Measurement: Length and height** **Small steps:** ● Compare lengths and heights ● Measure length ● Measure Height	● Pupils should be taught to: compare, describe and solve practical problems for measure and begin to record lengths and heights	**Vocabulary:** length, long, longer, short, shorter, wide, narrow, height, taller, shorter, compare, measuring, ruler, centimetres **Suggested activities:** **Fluency:** ● Measuring lines and objects with nonstandard units ● Fill in missing measurements ● Estimate lengths **Problem solving:** ● Word problems ● Using classroom equipment, can you find an object which is longer than your rubber but shorter than your pencil? ● Can you find a friend who is shorter than you but taller than your other friend? **Reasoning:** ● What would be a good unit to measure? (hands for larger object ● Blocks for smaller) ● Why? ● Teddy measures the length of the pencil. He says, its 10cm. Do you agree with Teddy? Explain why.

Spring block 4 **Measurement: Weight and volume** **Small steps:** ● Introduce weight and mass. ● Measure mass. ● Compare mass. ● Introduce capacity. ● Measure capacity. ● Compare capacity	● Pupils should be taught to compare, describe and solve practical problems for mass/weight capacity and volume ● measure and begin to record mass/weight-capacity and volume	**Skills**: The pairs of terms: mass and weight, volume and capacity, are used interchangeably at this stage. Pupils move from using and comparing different types of quantities and measures using non-standard units, including discrete (for example, counting) and continuous (for example, liquid) measurement, to using manageable common standard units. In order to become familiar with standard measures, pupils begin to use measuring tools such as a ruler, weighing scales and containers. **Vocab**: weight, mass, heavy, light,heavier than, lighter than, balanced, scale, volume, capacity, full, nearly full, empty, nearly empty, liquid, container **Suggested activities:** **Fluency**: ● The _____ is lighter than the …….. The _____ weighs ____ pencils . **Problem solving**: ● Word problems 'I'm thinking of an object. It is heavier than a pencil, but lighter than a dictionary'. **Reasoning**: ● What would be a good unit to measure? ● The class are seeing whether the balloon or apple will weigh more- Who is correct? Explain why. why?
Summer Block 1 **Number: Multiplication and division** **Small Steps:** ● Count in 10s. ● Make equal groups. ● Add equal groups. ● Make arrays. ● Make doubles. ● Make equal groups – grouping. ● Make equal groups –sharing	● Pupils should be taught to 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.	**Skills: Through** grouping and sharing small quantities, pupils begin to understand: multiplication and division; doubling numbers and quantities; and finding simple fractions of objects, numbers and quantities. They make connections between arrays, number patterns, and counting in twos, fives and tens. **Vocabulary:** multiples, counting in… forwards, backwards, repeated addition, patterns, equal groups, array, row, column, double, sharing equally, multiply, times **Suggested activities** **Fluency:** ● Share out a picnic ● count how many there are in each group. ● Arrange piles of objects equally- equal groups ● Arrays – 2s/5/s10s **Problem solving**: ● I have ten sweets how can I share this with my 5 friends ● Use concrete materials or pictures to complete the questions. - Alex has 4 equal groups. -Show me what Alex's groups could look like. - Whitney has 3 unequal groups. -Show me what Whitney's groups could look like.

		Reasoning: • Odd one out /Same or different • Which representation is correct? Say how you know. • Look at the piles Dora and Rosie are making hay bundles. • Who has made equal groups? how do you know
Summer Block 2 **Number: Fractions** **Small Steps:** • halving shapes or objects. • Halving a quantity. • Find a quarter of a shape or object. • Find a quarter of a quantity.	• Pupils should be taught to 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. ***fractions skills mentioned within measures sections-****Compare, describe and solve practical problems for: lengths and heights (for example, long/short, longer/shorter, tall/short, double/half)* *Compare, describe and solve practical problems for: mass/weight [for example, heavy/light, heavier than, lighter than]; capacity and volume [for example, full/empty, more than, less than, half, half full, quarter].*	**Skills**: Pupils are taught half and quarter as 'fractions of' discrete and continuous quantities by solving problems using shapes, objects and quantities. **Vocab:** whole, half, halves, split,shared equally, equal parts, non-equal parts, quarter **Suggested activities** **Fluency**: • recognise and find half a length, quantity, set of objects or shape. • connect halves and quarters to the equal sharing and grouping of sets of objects and to measures • recognising and combining halves and quarters as parts of a whole. • Use the squares to show: Less than a quarter shaded. Exactly a quarter shaded. • More than a quarter shaded. **Problem solving:** • Identify ¼ of a number or shape and know that all the parts must be equal parts of the whole **Reasoning:** • Odd one out /Same or different • Which representation is correct? Say how you know. • Mo is finding halves. Is hard to find half or an odd number. Do you agree with Mo? Explain your answer.
Summer Block 3: **Geometry: Position and Direction** **Small Steps**: • Describe turns • Describe position • Describe direction	• Pupils should be taught to: describe position, direction and movement, including whole, half, quarter and three-quarter turns ICT LINKS beebot etc. /chrome books programming	**Vocab:** full, half, quarter, three quarter, turn, direction, position, forwards, backwards, movement, top, in between, bottom, above, below, Suggested activities: **Fluency:** • Jack is directly above Alex. Eva is directly below Alex. _____ is to the right of Eva. There is no-one above Amir. What are the missing names? Add people to complete the grid and describe where they are. **Problem solving:**

		• Alex turns her number shape and it finishes facing this direction. What direction could it have started facing? What turn could it have made? **Reasoning:** • Are these statements correct? Is there more than one answer? Explain how you know. The shape has made a quarter turn. The shape has made a half turn. The shape has made a three-quarter **turn.**
Summer Block 4 **Number: place value (within 100)** **Small Steps:** • Counting to 100. • Partitioning numbers. • Comparing numbers (1). • Comparing numbers (2). • Ordering numbers. • One more, one less .	• Count to 100, forwards and backwards, beginning with 0 or 1, or from any given number. • Count, read and write numbers to 10 in numerals • Given a number, identify one more or one less. • Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least.	**Skills:** children begin to read and write numbers to 100 and out of sequence They reinforce the value of 2-digit numbers in real life and through direct teaching **Vocabulary:** number, numeral, digit, ones, tens, place value chart, partition, same, different, object, sort, group, set, count, numbers to 100, last, before, how many…? more, less, fewer, count on, forwards, backwards, bigger, smaller, pattern, match, greater than, less than, equal to, symbol, greatest, fewest, most, least, order, numberline, jumps, representation, part-whole, bar model **suggested activities:** **Fluency:** • How many flowers are there altogether? Can you represent the flowers using ten frames and counters/ union / dienes? • Part whole models with missing numbers **Problem solving:** • find consecutive and non-consecutive missing numbers in sequences. • Reasoning: • Odd one out /Same or different **Reasoning** • Which representation is correct? Say how you know
Summer block 5 **Measurement: Money** **Small Steps:** • Recognising coins. • Recognising notes • Counting in coins**.**	• Recognise and know the value of different denominations of coins and notes.	**Vocabulary:** coins, value, pence, pound, note, amount, worth, price, cost, spend, cheaper, more expensive **Suggested activities:** **Fluency:** • Can you name each coin? • Can you order the coins? can you say which are pounds and pence? • Shopping activities – exchanging money for objects **Problem solving:** • Match the cards with equal values.

		Reasoning: ● Using coins children make links to times tables. What do they notice?
Summer block 6 **2 weeks** **Measurement: Time** **Small Steps:** ● Before and after. ● Dates ● Time to the hour. ● Time to the half hour. ● Writing time. ● Comparing time**.**	● Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. ● order using language for example: **before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening** ● Compare, describe and solve practical problems for time **[for example, quicker, slower, earlier, later].** ● Recognise and use language relating to dates, including **days of the week, weeks, months and years. (hours, minutes, seconds).** ● •Measure and begin to record time	**Vocabulary:** before, after, morning, afternoon, evening, today, yesterday, tomorrow, day, month, year, days of the week, months of the year, time, clock, hour, minute, hour hand, minute hand, clock face, o'clock, half hour, half past, seconds, faster, slower, earlier, later **Suggested activities:** **Fluency:** ● order the events in the day First, I went to the park. After lunch, I went to the cinema. ● Before the cinema, I went to a café for lunch ● What time is lunch? going home? register etc. ● Time to the hour / half hour ● Use a calendar to look at the names of the months. -Discuss special dates in different children's lives e.g. birthdays, celebrations, holidays. Complete the sentences: My birthday is …. In ……. I went to ……. ● Draw the hour hand and minute hand on clock faces to show the times: **Problem solving:** ● Would you measure the duration of the activities in seconds, minutes or hours? Sort the activities into three groups: seconds, minutes and hours. **Reasoning:** ● Fill in the missing days of the week and complete the sentences- Today is Wednesday, yesterday was _____. Yesterday was Monday, today is _____. -

YEAR 2

Strand	Intent (Learning Questions)	Implementation (Skills Progression & Activities, **Reading +** *Vocabulary*)
Autumn Block 1 **Number: Place Value** **Small steps:** ● Count objects to	● count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward ● recognise the place value of each digit in a two-digit number (tens, ones)	**Skills:** building on year 1 knowledge and vocabulary -Using materials and a range of representations, pupils practice counting, reading, writing and comparing numbers to at least 100 and solving a variety of related problems to develop fluency. They count in multiples of three to support their later understanding of a third.

100 and 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. • Use a place value chart. • Compare objects. • Compare numbers. • Order objects and numbers. Count in 2s, 5s and 10s. Count in 3s.	• identify, represent and estimate numbers using different representations, including the number line • compare and order numbers from 0 up to 100; use <, > and = signs • read and write numbers to at least 100 in numerals and in words • use place value and number facts to solve problems.	As they become more confident with numbers up to 100, pupils are introduced to larger numbers to develop further their recognition of patterns within the number system and represent them in different ways, including spatial representations. Pupils should partition numbers in different ways (for example, 23 = 20 + 3 and 23 = 10 + 13) to support subtraction. They become fluent and apply their knowledge of numbers to reason with, discuss and solve problems that emphasise the value of each digit in two-digit numbers. They begin to understand zero as a place holder. **Vocabulary:** Year 1 vocab reinforced, plus…numbers to 100, (numerals and words), hundreds, partition, recombine, order (first, second, third, fourth etc), pairs, number sequences, **Suggested activities:** **Fluency:** • Read scales in divisions of ones, twos, fives and tens. • Partition two-digit numbers into different combinations of tens and ones, explaining their thinking verbally, in pictures or using apparatus. • Complete number sentences using < > or = Numbers to one hundred, Hundreds. partition, recombine • Hundred more/less • Part whole models / dienes • Race to 100 game place value • What number is represented in the place value chart? **Problem solving:** • find consecutive and non-consecutive missing numbers in sequences. • There are ten cookies in a pack. there are 7 packs how many cookies are there altogether? **Reasoning:** • Odd one out /Same or different • Which representation is correct? Say how you know.
Autumn Block: 2 **Number: Addition and subtraction** **Small steps:** • Fact families – Addition and subtraction bonds to 20.	Pupils should be taught to: • solve problems with addition and subtraction: • using concrete objects and pictorial representati including those involving numbers, quantities an measures applying their increasing knowledge of mental a written methods	**Skills: Pupils** extend their understanding of the language of addition and subtraction to include sum and difference. It is essential that children have the opportunity to discuss and share strategies for checking addition and subtraction calculations. Checking calculations is not restricted to using the inverse. Teachers should discuss using concrete resources, number lines and estimating as part of a wide range of checking strategies Pupils practice addition and subtraction to 20 to become increasingly fluent in deriving facts such as using 3 + 7 = 10; 10 – 7 = 3 and 7 = 10 – 3 to calculate

• Check calculations. • Compare number sentences. • Related facts. • Bonds to 100 (tens). • Add and subtract 1s. • 10 more and 10 less. • Add and subtract 10s. • Add a 2-digit and 1-digit number – crossing ten. • Subtract a 1-digit number from a 2-digit number – crossing 10. • Add two 2-digit numbers –not crossing ten –add ones and add tens. • Add two 2-digit numbers – crossing ten –add ones and add tens. • Subtract a 2-digit number from a 2-digit number –not crossing ten. • Subtract a 2-digit number from a 2-digit number – crossing ten – subtract ones and tens. • Bonds to 100 (tens and ones) • Add three 1-digit numbers	• recall and use addition and subtraction facts to 20 fluently, and derive and use related fa up to 100 • add and subtract numbers using concrete object 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 any order (commutative) and subtraction of one number from another cannot • recognise and use the inverse relationship betwe addition and subtraction and use this to check calculations and solve missing number problems. . •	30 + 70 = 100; 100 – 70 = 30 and 70 = 100 – 30. They check their calculations, including by adding to check subtraction and adding numbers in a different order to check addition (for example, 5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5). This establishes commutativity and associativity of addition. Recording addition and subtraction in columns supports place value and prepares for formal written methods with larger numbers. **Vocabulary**: as year 1 **Suggested activities:** **Fluency**: • Use concrete objects to check and prove whether the calculations are correct.12 – 4 = 8 7 + 8 = 15 • Create sentences based on a picture of 4 children in the park. Example There are 4 children playing in a park. One more child joins them so there will be 5 children playing together. • Continue the pattern 22 = 29 – 7 22 = 28 – 6 • Use concrete apparatus to show your thinking. **Problem solving/ reasoning:** • One apple costs 6p./A bag of 10 apples costs 50p If he needs 20 apples, what's the cheapest way to buy them?

Autumn Block: 3 **Geometry: shape**	Pupils should be taught to: ● 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.	Pupils handle and name a wide variety of common 2-D and 3-D shapes including: quadrilaterals and polygons, and cuboids, prisms and cones, and identify the properties of each shape (for example, number of sides, number of faces). Pupils identify, compare and sort shapes on the basis of their properties and use vocabulary precisely, such as sides, edges, vertices and faces. Pupils read and write names for shapes that are appropriate for their word reading and spelling. Pupils draw lines and shapes using a straight edge. **Vocabulary:** properties, polygon, quadrilateral, pentagon, hexagon, heptagon, octagon, sides, vertices, vertex, line of symmetry, symmetrical, mirror line, vertical, horizontal, diagonal, similarities, differences, surface, faces, edges, circular, rectangular Fluency: Problem solving: Reasoning:
Spring Block: 1 **Measurement: Money** **Small steps:** ● Count money – pence. ● Count money – pounds (notes and coins). ● Count money – notes and coins. ● Select money. ● Make the same amount. ● Compare money. ● Find the total. ● Find the difference.	Pupils should be taught to: choose and use appropriate standard units to estimate and 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 .	Pupils use standard units of measurement with increasing accuracy, using their knowledge of the number system. They use the appropriate language and record using standard abbreviations. Pupils become fluent in counting and recognising coins. They read and say amounts of money confidently and use the symbols £ and p accurately, recording pounds and pence separately. **Vocabulary:** equivalent amount, £ and p symbols, total, How much less? How many fewer? paid, change **Suggested activities:** **Fluency:** ● Can you name each coin? ● Can you order the coins? can you say which are pounds and pence? ● Shopping activities – exchanging money for objects **Problem solving:** ● Match the cards with equal values. **Reasoning:** ● Using coins children make links to times tables. What do they notice?

● Find change. ● Two-step problems		
Spring Block: 2 **Number: Multiplication and Division** **Small steps** ● Make equal groups. ● *Add equal groups.* ● *Multiplication sentences using the x symbol.* ● *Multiplication sentences from pictures.* ● *Use arrays.* ● *2 times-table.* ● *5 times-table.* 10 times-table.	Pupils should be taught to: ● recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers ● calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), 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 ● solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.	Pupils use a variety of language to describe multiplication and division. ● Pupils are introduced to the multiplication tables. They practice to become fluent in the 2, 5 and 10 multiplication tables and connect them to each other. They connect the 10-multiplication table to place value, and the 5-multiplication table to the divisions on the clock face. They begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations. **Vocabulary:** as year 1 **Suggested activities:** **Fluency:** ● Arrange objects equally- equal groups ● Use the x and divide symbols ● Arrays – 2s/5/s10s ● Bar models ● Part whole diagrams ● How can we show six equal groups with three in each group? ● How many ways can you represent this? ● Can you count in 2s to calculate how many socks there are? **Problem solving:** ● fill out missing numbers ● There are _3__ equal groups with _3__ in each group. 3___ + __3_ + __3_ = 9 **Reasoning:** ● How is 4 + 4 + 4 the same as 4 × 3? ● There are 10 wheels, how many bikes are there?

Spring Block: 2 **Number: Multiplication and Division** ● Make equal groups – sharing. ● Make equal groups – grouping.	● recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers ● calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs	Children divide by sharing to make equal groups using one to one correspondence. They need to do this in practical contexts then pictorially. Children will be introduced to the ÷ symbol. They will begin to see the link between division and multiplication. Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition. They begin to relate these to fractions and measures (for example, 40 ÷ 2 = 20, 20 is a half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (for example, 4 × 5 = 20 and 20 ÷ 5 = 4).

● Divide by 2. ● Odd and even numbers. ● Divide by 5. ● Divide by 10 .	● show that multiplication of two numbers can be done in any order (commutative) and division of one n solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts umber by another cannot	**Vocabulary:** as year 1 with divide/division How many do you have to begin with? How many equal groups are you sharing between? How many are in each group? How do you know that you have shared the objects equally? **Suggested activities:** **Fluency:** ● Practically share the 12 cubes into the two boxes. Can you share the 12 cubes into 3 boxes? ● Tim uses a number line to work out how many equal groups of 2 he can make from 12 -Use a number line to work out how many equal groups of 5 you can make from 30 **Problem solving:** ● Jane has 20 sweets and shares them between 5 friends. Tom has 20 sweets and shares them between 10 friends. Whose friends will receive the most sweets? How do you know? **Reasoning:** Share 18 counters in two equal groups. Take another 18 counters and put them in groups of 2, What's the same? What's different?
Spring Block: 3 **Measurement: Length and Height** **Small steps:** ● Measure length (cm). ● Measure length (m). ● Compare lengths. ● Order lengths. ● Four operations with lengths	Pupils Should be taught to compare practical problems for: ● lengths and heights [for example, long/short, longer/shorter, tall/short, double/half ● measure and begin to record lengths and heights .	Pupils move from using and comparing different types of quantities and measures using non-standard units, including discrete (for example, counting) and continuous (for example, liquid) measurement, to using manageable common standard units. In order to become familiar with standard measures, pupils begin to use measuring tools such as a ruler, weighing scales and containers. Vocabulary: as year 1 - cm/m /km **Suggested activities:** **Fluency:** **Problem solving:** Can you split the teddies into three equal groups? Can you split the teddies into three unequal groups? Children understand that halving is splitting a whole into two equal parts. They are introduced to the notation 12 for the first time and will use this alongside sentence stems and 'half' or 'halves'. Children will also explore halves in different contexts, for example, half of a length, shape or object. The whole pie is split into _____ equal parts. Each part is worth a _____

Spring Block: 4 **Measurement: Mass, Capacity and Temperature** **Small steps** ● Compare mass. ● Measure mass in grams. ● Measure mass in kilograms. ● Compare capacity. ● Millilitres. ● Litres. ● Temperature	Pupils should be taught to: ● choose and use appropriate standard units to estimate and measure capacity (litres/ml) to the nearest appropriate unit, measuring vessels ● Compare and order lengths, mass, volume/capacity and record the results using >, < and =.	**Children build on their knowledge from year 1 to use standard units of measure** **Vocabulary: as year 1 – ML/L** **Suggested activities:** **Fluency:** Use gram weights to measure the mass of objects using a balance scale. The _____ weighs _____ grams. **Problem solving:** The brown parcel weighs twice as much as the blue parcel. The green parcel weighs 2 kg more than 30 kg The blue parcel weighs 12 kg less than the green parcel. Draw an arrow to show where each parcel would be on the scale.
Summer Block: 1 **Statistics** **Small steps :** ● Make tally charts. ● Draw pictograms (1-1). ● Interpret pictograms (1-1). ● Draw pictograms (2, 5 and 10). ● Interpret pictograms (2, 5 and 10).	Pupils should be taught to: ● 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 totaling and comparing categorical data. ● science / CT link	Pupils record, interpret, collate, organise and compare information (for example, using many-to-one correspondence in pictograms with simple ratios 2, 5, 10). This can be taught discreetly or cross curricular through science / ICT Children use tally charts to produce pictograms. To build children's understanding and confidence they begin by filling in one missing column or row. Children then move on to editing given data to see the importance of checking that data reflects the pictogram. Finally, children draw a pictogram from the data given. It is important that children see pictograms both horizontally and vertically. Children look at pictograms where the symbols represent 2, 5 or 10 items. Careful consideration needs to be given to the picture or symbol used so that it can be halved. They count in twos, fives, and tens to complete and draw pictograms. Children use their knowledge of number lines to link to the idea of a scale up the side of a block diagram. They read the scale on the bar chart to work out what each block represents. Moving from concrete to pictorial, children build block diagrams using cubes and then move to drawing and interpreting block diagrams.

• Block diagrams.		**Vocabulary:** Count, tally, sort, Vote, Graph, block graph, pictogram, Represent, Group, set, list, table, Label, title, Most popular, most common, least popular, least common **Suggested activities:** **Fluency:** •Complete the tally chart. •Complete the pictogram •Use the tally chart to help you complete the pictogram. Use the pictogram to answer the questions • draw the pictogram, with a heading, based on given statements • **interpret the chart** **Problem solving/ Reasoning: answer questions such as:** • How many more points did Class 2 • get than Class 4? • How many fewer points did Class 3 • get than Class 5? • How many points did Class 2 and class 3 get altogether?
Spring Block: 2 **Number: Fractions** **Small steps:** • Make equal parts. • Recognise half. Find half. • Recognise quarter. • Find a quarter. • Recognise a third. • Find a third. • Unit fractions. • Non0unit fractions. • Equivalence of ½ and ²/₄.	Pupils should be taught to: • recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity • write simple fractions for example, $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$., describe and solve	**Skills**: Pupils use fractions as 'fractions of' discrete and continuous quantities by solving problems using shapes, objects and quantities. They connect unit fractions to equal sharing and grouping, to numbers when they can be calculated, and to measures, finding fractions of lengths, quantities, sets of objects or shapes. They meet $\frac{3}{4}$ as the first example of a non-unit fraction. Pupils should count in fractions up to 10, starting from any number and using the $\frac{1}{2}$ and $\frac{2}{4}$ equivalence on the number line (for example, $1\frac{1}{4}$, $1\frac{2}{4}$ (or $1\frac{1}{2}$), $1\frac{3}{4}$, 2). This reinforces the concept of fractions as numbers and that they can add up to more than one. **Vocabulary:** Three quarters, one third, a third Equivalence, equivalent **Suggested activities:** **Fluency:** Shade 3/4 of each shape Using two identical strips of paper, explore what happens when you fold the strips into two equal pieces and four equal pieces. Compare on of the two equal pieces with two of the four equal pieces. **Problem solving and reasoning:** George has a jar of 12 cookies. He gives half of them to Sam, and 24 of them to Ben- who gets the most Using red and blue cubes, build two towers to convince me that 12 and 24 are equal.

• Find three quarters. • Count in fractions		
Summer Block: 3 **Geometry: Position a** **Small steps** • Describing movem • Describing turns. • Describing movem • Making patterns w	Pupils should be taught to: • order and arrange combinations of mathematical objects in patterns and sequences • use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise).	Pupils should work with patterns of shapes, including those in different orientations. Pupils use the concept and language of angles to describe 'turn' by applying rotations, including in practical contexts (for example, pupils themselves moving in turns, giving instructions to other pupils to do so, and programming robots using instructions given in right angles). **Vocabulary**: as year 1 -Rotation, Clockwise, anticlockwise Straight line Ninety degree turn, right angle **Suggested activities:** **Fluency:** Record these movements on the grid using arrows. The turtle moves 1 square right. The bee moves 3 squares left. The bird moves 1 square backwards. The sheep moves 1 square forwards **Problem solving and reasoning:** How many different routes can you write for the horse to get to the hay? Use the words forwards, backwards, left and right.
Summer Block: 4 **Problem solving and efficient methods** 2 weeks	Based on strand Appropriate to class requirement	-
Summer Block: 5 **Measurement: Time** 2 weeks Small Steps • O'clock and half past. • Quarter past and quarter to.	Pupils should be taught to: • compare and sequence intervals of time • 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 • know the number of minutes in an hour and the number of hours in a day	Pupils use standard units of measurement with increasing accuracy, using their knowledge of the number system. They use the appropriate language and record using standard abbreviations. They become fluent in telling the time on analogue clocks and recording it. **Vocabulary**: as year 1 - Quarter past/to **Suggested activities:** **Fluency**: Look at the clocks. Discuss how the minute hand has travelled. Identify the time is quarter past the hour and quarter to the hour. Give the children individual clocks with moveable hands and ask them to make quarter to/past times.

• Telling time to 5 minutes. • •Minutes in an hour, hours in a day. • Find durations of time. • Compare durations of time .		**Problem solving:** How many quarters of an hour are between 7 o'clock and 9 o'clock. Explain how you found the answer . **Reasoning and problem solving:** Sophia starts her Maths questions at 10 past 11 Each question takes her 5 minutes to complete. She completes 7 questions. What time does Sophia finish her Maths? Explain how you found the answer.

YEAR 3

Strand	Intent (Learning Questions)	Implementation (Skills Progression & Activities, **Reading +** *Vocabulary*)
Autumn Block 1 Number: Place Value	• count from 0 in multiples of 4, 8, 50 and 100; 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 • identify, represent and estimate numbers using different representations • read and write numbers up to 1000 in numerals and in words	**Skills:** They use larger numbers to at least 1000, applying partitioning related to place value using varied and increasingly complex problems, building on work in year 2 (for example, 146 = 100 + 40 and 6, 146 = 130 + 16). Using a variety of representations, including those related to measure, pupils continue to count in ones, tens and hundreds, so that they become fluent in the order and place value of numbers to 1000. **Vocabulary:** ones, tens, hundreds, thousand, place value chart, place value columns, compare, order, value, digit, partition, part-whole, count, greater than > less than < equal to = **Suggested activities:** **Fluency:** - CPA - use Diennes and place value counters to represent numbers - Represent numbers using part-whole models to partition - Place numbers on a numberline **Problem solving:** - Use digit cards to make numbers - Using place value counters, how many different ways can you make _____? - Children use clues to find out mystery number

	• solve number problems and practical problems involving these ideas.	- Find all possibilities to a problem **Reasoning:** - Which representation is the odd one out and why? - Explain whether a statement is always, sometimes or never true - Spot the mistake and explain - True or false? - Which representation is correct? Explain how you know.
Autumn Block 2 Number: 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 • solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.	**Skills:** Pupils practise solving varied addition and subtraction questions. For mental calculations with two-digit numbers, the answers could exceed 100. Pupils use their understanding of place value and partitioning, and practise using columnar addition and subtraction with increasingly large numbers up to three digits to become fluent See Queenswell Calculation Policy for progression of mental and written methods **Vocabulary:** Ones, tens, hundreds, digit, value, place value columns, add, , sum, increase, total, part, whole, altogether, more than, subtract, difference, less than, fewer, decrease, takeaway, equal to, balanced, is the same as, inverse, bar model, exchange, formal written method, multiples of 10, 100, **Suggested activities:** **Fluency:** - Represent the relationship between addition and subtraction in part-whole models and bar models - Make, draw and write calculations using Diennes and place value counters - Partitioning - Number Lines - Missing numbers in calculations - Complete number sentences using < > or = - Formal written methods - Using different methods and explaining which one is more efficient **Problem solving:** - Word problems (using bar models) - The answer is ____ What could the calculation be? - Missing digits in calculations - How many ways can you make ____? - Which model represents this problem? - Find all possible solutions - Write a word problem for a number sentence or bar model

		Reasoning: - Is this a good estimate? Why? - Check answers to calculations and correct mistakes - How did they work out this answer? Could you use a better method? - Which method do you prefer and why? - Can you explain the steps of a method? - Which one is the odd one out and why?
Autumn Block 3 Number: Multiplication and Division A	• count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number • recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	**Skills:** Children can now count in multiples of 2, 5, 10, 3, 4, 8, 50 and 100 Continue to practise their mental recall of multiplication tables when they are calculating mathematical statements in order to improve fluency. Through doubling, they connect the 2, 4 and 8 multiplication tables. Pupils develop efficient mental methods, for example, using commutativity and associativity (for example, 4 × 12 × 5 = 4 × 5 × 12 = 20 × 12 = 240) and multiplication and division facts (for example, using 3 × 2 = 6, 6 ÷ 3 = 2 and 2 = 6 ÷ 3) to derive related facts (for example, 30 × 2 = 60, 60 ÷ 3 = 20 and 20 = 60 ÷ 3). See Queenswell Calculation Policy for progression of mental and written methods **Vocabulary:** multiply, multiple, factor, equal groups of, commutative, repeated addition, product, lots of, divide, grouping, sharing, repeated subtraction, patterns **Suggested activities:** **Fluency:** - Use physical resources and pictures to show equal and unequal groups - Children represent multiplication in different ways (on a numberline, as repeated addition, in a bar model, using arrays) - Children understand multiplication as repeated addition (counting on) and can show in a numberline and count in multiples. - Use arrays to show relationship between multiplication and division - Use stem sentences to reinforce key vocab and concepts - Use calculations they know to help solve calculations they don't - e.g. use 10 x4 to work out 9x4 and understand commutativity **Problem solving:** - Word problems - Which representations show which calculation - How many different ways can you show_____? - Function machine and loop cards **Reasoning:** - Which number sentences would find the answer to _____? Explain how you know - Proving statements - Noticing patterns between the times tables - Always, sometimes, never statements that children have to prove

Spring Block 1 Number: Multiplication and division B	• 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 • 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.	Pupils develop reliable written methods for multiplication and division, starting with calculations of two-digit numbers by one-digit numbers and progressing to the formal written methods of short multiplication and division. Pupils solve simple problems in contexts, deciding which of the four operations to use and why. These include measuring and scaling contexts, (for example, four times as high, eight times as long etc.) and correspondence problems in which m objects are connected to n objects (for example, 3 hats and 4 coats, how many different outfits? 12 sweets shared equally between 4 children; 4 cakes shared equally between 8 children). See Queenswell Calculation Policy for progression of mental and written methods **Vocabulary:** multiply, multiple, factor, equal groups of, commutative, repeated addition, product, lots of, divide, grouping, sharing, repeated subtraction, patterns, scaling (____ times bigger/ smaller) **Suggested activities:** **Fluency:** - Use Diennes and place value counters to show groups of and multiply 2 digit by 1 digit numbers - Use place value charts and part-whole models to solve calculations - Use physical resources to divide into groups **Problem solving:** - Present children with method and they have to work out what has been done and use different methods themselves - Use digit cards to complete calculations - Use < > and = to compare multiplication and division statements - Word problems - 'How many ways' investigations **Reasoning:** - Proving statements - True or false statements - Spotting mistakes/ saying whether a method is correct or incorrect - Always, sometimes, never statements - Odd one out
Spring Block 2 Measurement: Length and perimeter	• measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) • measure the perimeter of simple 2-D shapes	**Skills:** Pupils 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, 1 kg and 200g) and simple equivalents of mixed units (for example, 5m = 500cm). The comparison of measures includes simple scaling by integers (for example, a given quantity or measure is twice as long or five times as high) and this connects to multiplication. **Vocabulary:** Length, width, height, distance, centimetres, millimetres, perimeter, convert, 2D shapes, measure, units of measure, equipment, equivalent, **Suggested activities:** **Fluency:** - Measuring lines and objects

		- Matching objects to units of measurement and equipment - Matching equivalent measurements - Fill in missing measurements - Estimate lengths - Comparing using statements and symbols - Find perimeter of images and objects - Tick images you can find perimeter of - Calculate perimeters of shapes **Problem solving:** - Missing sections of rulers - Sorting using diagrams and tables - Word problems - Which route is the fastest? - How many different ways can you make _____? - Using cm squares to make different shapes and finding perimeters. What is the largest/ smallest perimeter you can make? - Given perimeter and have to work out lengths of sides - How many rectangles can you draw with a perimeter of ____cm? **Reasoning:** - Who is correct? Spot mistakes - Using clues to work out measurement - Always, sometimes, never statements
Spring Block 3 Number: Fractions A	• 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, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators • recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators • solve problems that involve all of the above.	**Skills:** Pupils connect tenths to place value, decimal measures and to division by 10. They begin to understand unit and non-unit fractions as numbers on the number line, and deduce relations between them, such as size and equivalence. They should go beyond the [0, 1] interval, including relating this to measure. They continue to recognise fractions in the context of parts of a whole, numbers, measurements, a shape, and unit fractions as a division of a quantity. **Vocabulary:** fraction, whole, part, equal, divide, share, unit/ non-unit fraction, numerator, denominator, half, third, quarter, fifth, tenth, equivalent, decimal **Suggested activities:** **Fluency:** - Fractions of shapes (different shapes for variation) - Fractions on a numberline - Fractions of a group - Bar models to show fractions - Part whole models to show fractions - Counting forwards and backwards in fractions - Sequencing fractions - Representing tenths in different ways (words, pictures, decimals, numberline) - Finding fractions of numbers and amounts using division

		Problem solving: - Word problems - Sorting fractions into tables - Completing bar models - Placing decimals and fractions on numberline - Filling in missing values - Finding number in whole set - What fraction of original is this? **Reasoning:** - True or false statements - Complete the sentence - Odd one out giving reasons - Spot mistakes
Spring Block 4 Measurement: Mass and Capacity	• measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)	**Skills:** Pupils 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, 1 kg and 200g) and simple equivalents of mixed units (for example, 5m = 500cm). **Vocabulary:** mass, grams, unit of measurement, convert, kilograms, capacity, volume, millilitres, litres, scale, interval, weight, estimate, measuring jug **Suggested activities:** **Fluency:** - Using scales and measuring jugs to measure mass and capacity - Reading intervals (identifying missing intervals) and explaining what is different about the scales - Draw arrows on scales and measuring jugs to show mass and capacity - Complete statements to show conversion using < > and = - Use a range of representations to add and subtract mass (part-whole models, bar models etc) - Missing amounts in calculations **Problem solving:** - Word problems - Using objects and scales to get as close to a set weight as possible - Using statements and clues to work out missing value **Reasoning:** - Who do you agree with? Why? - True or false statements - Spot and correct mistakes

Summer Block 1 Number: Fractions B	• recognise and show, using diagrams, equivalent fractions with small denominators • add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$] • compare and order unit fractions, and fractions with the same denominators	**Skills:** Pupils understand the relation between unit fractions as operators (fractions of), and division by integers. Pupils practise adding and subtracting fractions with the same denominator through a variety of increasingly complex problems to improve fluency. **Vocabulary:** fraction, whole, part, equal, divide, share, unit/ non-unit fraction, numerator, denominator, half, third, quarter, fifth, tenth, equivalent, decimal, compare, smallest, largest, descending / ascending order, **Suggested activities:** **Fluency:** - Represent equivalent fractions in different ways - using cuisenaire rods, strips of paper, squared paper, on a numberline, fraction wall - Representing fractions in different ways using diagrams, words, numbers - Use < > and = to compare fractions - Ordering fractions/ placing fractions on a numberline - Write number story to describe calculation - Part- whole models **Problem solving:** - Finding patterns/ investigating equivalent fractions - Using clues to find out which fraction is being described - How many different ways? - How many addition and subtraction calculations can you make using a model? - Missing fractions **Reasoning:** - Odd one out - Who is correct/ incorrect? - Is this possible? - Prove a statement

Summer Block 2 Measurement: Money	• add and subtract amounts of money to give change, using both £ and p in practical contexts	**Skills:** Pupils continue to become fluent in recognising the value of coins, by adding and subtracting amounts, including mixed units, and giving change using manageable amounts. They record £ and p separately. The decimal recording of money is introduced formally in year 4. **Vocabulary:** pounds, pence, convert, amount, value, difference, counting, total, cost, more, less, difference, change **Suggested activities:** **Fluency:** - Adding pounds and pence to give a total amount - Using coins to make same amount in different ways - Using <> and = to compare amounts - Using coins to compare amounts and convert between pounds and pence - Using part-whole models - Working out change by finding the difference (using a numberline) **Problem solving:** - ____ number of coins in purse. What is the greatest/ least amount of money she could have in purse? - Word problems - Has he/she got enough money? - Working out how much each person has from clues **Reasoning:** - Correct and incorrect methods - Which method do you prefer and why?
Summer Block 3 Measurement: Time	• 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 and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight	**Skills:** Pupils use both analogue and digital 12-hour clocks and record their times. In this way they become fluent in and prepared for using digital 24-hour clocks in year 4. **Vocabulary:** seconds, minutes, hours, days, weeks, months, years, months of the year, midday, midnight, morning, afternoon, evening, o'clock, half past, quarter to, quarter past, hour hand/minute hand, digital/ analogue clock, timetable, duration, earliest, latest, 12-hour/ 24-hour clock **Suggested activities:** **Fluency:** - Explore real life calendars - Complete statements about time - Put dates in order - Say what time is shown on a clock - Draw hands on clock to show time - Match times and representations - Sort times from earliest to latest - Read timetables set out in different ways and answer questions

	• 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].	- Use a numberline to work out time intervals and duration - Use < > and = to compare time durations **Problem solving:** - Use clues to work out birthdays - What time could it be? Find all possible answers - Missing hands on a clock - Word problems **Reasoning:** - Which statement do you agree with and why? - Proving statements - Which method is correct? - True or false statements
Summer Block 4: Geometry: Properties of Shape	• draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them • 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.	**Skills:** Pupils' knowledge of the properties of shapes is extended at this stage to symmetrical and non-symmetrical polygons and polyhedra. Pupils extend their use of the properties of shapes. They should be able to describe the properties of 2-D and 3-D shapes using accurate language, including lengths of lines and acute and obtuse for angles greater or lesser than a right angle. Pupils connect decimals and rounding to drawing and measuring straight lines in centimetres, in a variety of contexts. **Vocabulary:** angles, turns, positions, direction, North, South, East, West, clockwise, anti-clockwise, whole turn, quarter turn, half turn, right angle, acute angle, obtuse angle, horizontal, vertical, parallel, perpendicular, 2 D shapes, length, width, 3 D shapes, faces, edges, vertices, measure, centimetres, metres, millimetres, line of symmetry, quadrilateral, square, rectangle, triangle, cube, cuboid, pyramid, prism, properties **Suggested activities:** **Fluency:** - Children to move to face different directions and get used to the vocabulary of whole turn, clockwise etc - Use clocks and images to notice angles - Create right angle testers and use these to say whether angles in shapes are acute, obtuse or right angles - Sort shapes according to angles/ properties - Measure and draw lines with a ruler in cm and mm - Spot horizontal/ vertical lines and parallel/ perpendicular lines in real life and images - Describe 2D and 3D shapes using properties - Draw shapes according to specifications - Use clay, straws, polygon, and nets to make 3D shapes **Problem solving:** - Label all angles in name - Complete shapes and lines - Create own image with set number of right angles - Describe a shape for friend to draw - Work out distance on map by measuring straight lines - Sorting shapes into carroll diagrams **Reasoning:**

		- Who do you agree with? - Are they correct? Explain why - What is the same and what is different about these shapes? - What could the shape be? - True or false statements - Explain the mistake
Summer Block 5 Statistics	● interpret and present data using bar charts, pictograms and tables ● solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.	**Skills:** Pupils understand and use simple scales (for example, 2, 5, 10 units per cm) in pictograms and bar charts with increasing accuracy. They continue to interpret data presented in many contexts. **Vocabulary:** data, information, graph, chart, pictograms, bar charts, tables, tally, axis, difference, most popular, least popular, interpreting **Suggested activities:** **Fluency:** - Complete graphs and charts - Draw graphs and charts from given data - Answer questions about a graph or chart - most/ least popular? Difference between - Ask questions about a graph or chart **Problem solving:** - Work out missing information **Reasoning:** - What's the same and what is different? - Which chart or graph is most suitable and why? - Which do you prefer and why?
YEAR 4		
Strand	**Intent (Learning Questions)**	**Implementation (**Skills Progression & Activities, **Reading +** ***Vocabulary*****)**
Autumn Block 1 Number: Place value	● find 1,000 more or less than a given number ● count backwards through 0 to include negative numbers ● recognise the place value of each	**Skills:** Using a variety of representations, including measures, pupils become fluent in the order and place value of numbers beyond 1,000, including counting in 10s and 100s, and maintaining fluency in other multiples through varied and frequent practice. They begin to extend their knowledge of the number system to include the decimal numbers and fractions that they have met so far. They connect estimation and rounding numbers to the use of measuring instruments. Roman numerals should be put in their historical context so pupils understand that there have been different ways to write whole numbers and that the important concepts of 0 and place value were introduced over a period of time.

	digit in a four-digit number (1,000s, 100s, 10s, and 1s) ● order and compare numbers beyond 1,000 ● identify, represent and estimate numbers using different representations ● 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 ● read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of 0 and place value	**Vocabulary:** ones, tens, hundreds, thousands, place value chart, place value columns, compare, order, value, digit, partition, part-whole, count, greater than > less than < equal to =, round, estimate, Roman numerals, more, less, positive numbers, negative numbers, zero as place holder **Suggested activities:** **Fluency:** - Use different representations and resources to explore the place value of numbers (place value charts, Diennes, place value counters, number lines) - Show numbers in different ways (words, digit and pictures) - Be about to say the value of each digit in 4 digit numbers - Use part whole models to partition numbers in different ways - Use < > and = to compare numbers - Place numbers on a numberline or write them in order from smallest to largest etc - Arranging digit cards to make smallest/ largest numbers - Notice patterns when counting in multiples of 25 - Use real life examples e.g. thermometers when teaching negative numbers - Use lollipop sticks to make Roman numerals **Problem solving:** - Finding all possibilities to a problem - Make numbers that follow rules - Use clues to find missing numbers - Finding start and end numbers on a numberline - Writing own problem - Missing digits **Reasoning:** - Always, sometimes, never statements - True or false? Explain how you know - Odd one out - Spotting mistakes
Autumn Block 2 Number: 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-	**Skills:** Pupils continue to practise both mental methods and columnar addition and subtraction with increasingly large numbers to aid fluency (see Mathematics appendix 1 of National Curriculum and Queenswell Calculation Policy). **Vocabulary:** Ones, tens, hundreds, thousands, digit, value, place value columns, add, , sum, increase, total, part, whole, altogether, more than, subtract, difference, less than, fewer, decrease, takeaway, equal to, balanced, is the same as, inverse, bar model, exchange, formal written method, inverse, estimate, operation, zero as place holder **Suggested activities:** **Fluency:** - Use place value charts, counters and diennes to represent numbers and add or subtract using formal written method, physically showing exchange - Children to understand the relationship between addition and subtraction (using bar models/ part-whole models, numberlines and physical resources)

	step problems in contexts, deciding which operations and methods to use and why	- Children to draw numbers and show exchanging - Use formal written methods - Work out missing numbers in calculations - Use < > and = to compare statements - Real life examples of addition and subtraction - Missing numbers/ digits - Checking calculations using inverse **Problem solving:** - How many ways can you find? - Word problems - Magic squares - Reaching a target number - Strategies to win games involving addition and subtraction **Reasoning:** - What is the same/ different? - Why are some calculations easier than others? - Are they correct? Explain your answer - Do you agree/ disagree with a statement? - Explaining steps of a method - Show different methods and explain which is the most efficient
Autumn Block 3 Measurement: Area	● find the area of rectilinear shapes by counting squares	**Skills:** They relate area to arrays and multiplication. Vocabulary: length, width, area, multiply, dimensions, arrays, square, rectangle, rectilinear **Suggested activities:** **Fluency:** - Exploring what area is using sticky notes and squared paper to make different shapes and cover surfaces - Using squares and arrays to calculate area - Using < > and = to compare area of different shapes **Problem solving:** - Calculating area of shapes with missing parts - What is the smallest/largest possible area you can make? - Working systematically to explore all possible rectilinear shapes that can be made with squares - Making letters on squared paper and calculating area - Spotting patterns in shapes and continuing sequence **Reasoning:** - Saying which method is more accurate/ efficient and why - What is the same? What is different about the shapes?
Autumn Block 4 Number: Multiplication and Division A	● recall multiplication and division facts for multiplication tables up to 12 × 12	**Skills:** Pupils continue to practise recalling and using multiplication tables and related division facts to aid fluency. Pupils practise mental methods and extend this to 3-digit numbers to derive facts, (for example 600 ÷ 3 = 200 can be derived from 2 x 3 = 6). Pupils write statements about the equality of expressions (for example, use the distributive law 39 × 7 = 30 × 7 + 9 × 7 and associative law (2 × 3) × 4 = 2 × (3 × 4)). They combine their knowledge of number facts and rules of arithmetic to

	• count in multiples of 6, 7, 9, 25 and 1,000 • use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers • solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	solve mental and written calculations for example, 2 x 6 x 5 = 10 x 6 = 60. Pupils solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers. This should include correspondence questions such as the numbers of choices of a meal on a menu, or 3 cakes shared equally between 10 children. See Queenswell Calculation Policy for progression of mental and written methods **Vocabulary:** multiply, multiple, factor, equal groups of, commutative, repeated addition, product, lots of, divide, grouping, sharing, repeated subtraction, patterns, scaling (____ times bigger/ smaller) multiplication and division facts, scaling **Suggested activities:** **Fluency:** - Use range of representations to show concept of multiplication including arrays, number lines, bar models, groups (place value charts when x by 10 and 100) - Use practical resources like place value counters, Diennes, Numicon, number lines and counting sticks to show multiplication as repeated addition - Use measurements (length and money) for children to practise x and dividing by 10 and 100 - Matching calculations to answers/ completing calculations and fact families - Noticing patterns in times tables - Missing numbers in sequences - Matching representations to calculations **Problem solving:** - Word problems - Find original number/ calculation - Completing tables and missing values - Use number cards to fill in the missing digits - Write number story/ word problem for calculation **Reasoning:** - Always, sometimes, never statements - Correcting mistakes in calculations - Odd one out - Explaining patterns in times tables
Spring Block 1 Number: Multiplication and Division **B**	• recall multiplication and division facts for multiplication tables up to 12 × 12 • recognise and use factor pairs and	**Skills:** Pupils practise to become fluent in the formal written method of short multiplication and short division with exact answers (see Mathematics appendix 1 and Queenswell Calculation Policy). Pupils solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers. This should include correspondence questions such as the numbers of choices of a meal on a menu, or 3 cakes shared equally between 10 children. multiply, multiple, factor, equal groups of, commutative, repeated addition, product, lots of, divide, grouping, sharing, repeated subtraction, patterns, scaling (____ times bigger/ smaller)

	commutativity in mental calculations ● multiply two-digit and three-digit numbers by a one-digit number using formal written layout	**Vocabulary:** multiply, multiple, factor, factor pairs, prime number, equal groups of, commutative, repeated addition, product, lots of, divide, grouping, sharing, repeated subtraction, patterns, scaling (____ times bigger/ smaller) multiplication and division facts, scaling, formal written method **Suggested activities:** **Fluency:** - Use range of representations to show concept of multiplication including arrays, number lines, bar models, groups - Use practical resources like place value counters, Diennes, Numicon, number lines and counting sticks to show multiplication as repeated addition - Complete calculations - Use arrays and diagrams to show factor pairs - Use different methods and say which is the most efficient - Use part-whole models to show how to partition 2 digit number when multiplying and dividing - Use CPA when teaching formal written method - Write calculation shown in representation **Problem solving:** - Word problems - Writing own word problems for calculations - Explaining mistakes - Choose digit cards to complete calculations - Finding all possible solutions to problems - How many ways investigations **Reasoning:** - Explaining mistakes - Comparing methods - Always, sometimes, never statements
Spring Block 2 Measurement: Length and Perimeter	● measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres ● convert between different units of measure [for example, kilometre to metre; hour to minute]	**Skills:** Pupils build on their understanding of place value and decimal notation to record metric measures, including money. Perimeter can be expressed algebraically as 2(a + b) where a and b are the dimensions in the same unit. **Vocabulary:** Length, distance, width, centimetres, metres, millimetres, kilometres, perimeter, rectilinear, square, rectangle, dimensions, unit of measurement, convert **Suggested activities:** **Fluency:** - Use real life distances/ objects to show units of measurement - Converting m and cm - Real life problems e.g. calculating routes, measuring - Find perimeter of shapes, draw shapes with set perimeter - Finding perimeters of shapes made from other shapes or with missing lengths **Problem solving:** - How many different shapes can you draw with the same perimeter?

		- Word problems - Missing measurements that add to a total distance - Investigate letters that are rectilinear shapes - Arranging tiles/ squares to make shapes with set perimeter - Draw all rectangles to fit rules **Reasoning:** - Always, sometimes, never statements - Who is correct? Explain - Odd one out
Spring Block 3 Number: 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 100 and dividing tenths by 10 • 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 • add and subtract fractions with the same denominator	**Skills:** Pupils make connections between fractions of a length, of a shape and as a representation of one whole or set of quantities. Pupils use factors and multiples to recognise equivalent fractions and simplify where appropriate (for example, $\frac{6}{9} = \frac{2}{3}$ or $\frac{1}{4} = \frac{2}{8}$). Pupils continue to practise adding and subtracting fractions with the same denominator, to become fluent through a variety of increasingly complex problems beyond one whole. Pupils are taught throughout that decimals and fractions are different ways of expressing numbers and proportions. They practise counting using simple fractions and decimals, both forwards and backwards. Pupils should connect hundredths to tenths and place value and decimal measure. **Vocabulary:** fraction, whole, part, equal, divide, share, unit/ non-unit fraction, numerator, denominator, half, third, quarter, fifth, tenth, equivalent, decimal, quantity, whole number, ascending, descending, hundredths **Suggested activities:** **Fluency:** - Explore fractions in different representations e.g. fractions of shapes, quantities, fractions on a number line, bar models - Use a range of resources to show fractions - cubes, numicon, cuisenaire - Use paper to divide into equal parts and show fractions and equivalent fractions - Use fraction walls and cuisenaire to show equivalent fractions - Use part-whole models for fractions greater than 1 - Completing fractions on a numberline, in a sequence - Bar models to show how to calculate fractions of quantities **Problem solving:** - Word problems - How many equivalent fractions can you see in this picture? - Using digit cards to complete equivalent fractions - How many different ways can you find to solve calculation? **Reasoning:** - Matching representations and justifying choices - Always, sometimes, never statements - Spot the mistake - Do you agree/ disagree? Explain why

		- Which model/ representation is correct? - True or false?
Spring Block 4 Number: Decimals	● recognise and write decimal equivalents of any number of tenths or hundreds ● 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 ● compare numbers with the same number of decimal places up to 2 decimal places ● solve simple measure and money problems involving fractions and decimals to 2 decimal places	**Skills:** Pupils' understanding of the number system and decimal place value is extended at this stage to tenths and then hundredths. This includes relating the decimal notation to division of whole number by 10 and later 100. Pupils learn decimal notation and the language associated with it, including in the context of measurements. They make comparisons and order decimal amounts and quantities that are expressed to the same number of decimal places. They should be able to represent numbers with 1 or 2 decimal places in several ways, such as on number lines. **Vocabulary:** Whole number, ones, tenths, hundredths, decimal point, place value, digit, decimal place, value, decimal equivalents **Suggested activities:** **Fluency:** - Using Diennes and place value counters to represent decimals in a place value chart - Use part-whole models to partition a fractions and decimals into tenths and hundredths - Use hundred squares to shade tenths and hundredths - Representing decimals as fractions, images and words - Complete stem sentences - Place decimals on a numberline - Use counters and place value chart to show what happens to digits when multiply and divide by 10 **Problem solving:** - How many different numbers can you make? - List all possibilities **Reasoning:** - What is the same and what is different? - Which one is the odd one out? - Who is correct? Explain - Describe the pattern
Summer Block 1 Number: Decimals	● recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ ● round decimals with 1 decimal place	**Skills:** Pupils learn decimal notation and the language associated with it, including in the context of measurements. They make comparisons and order decimal amounts and quantities that are expressed to the same number of decimal places. They should be able to represent numbers with 1 or 2 decimal places in several ways, such as on number lines. **Vocabulary:** Whole, decimal, fraction, half, quarter, round, decimal place, quarter, half, three quarters, nearest whole number **Suggested activities:** **Fluency:** - Make a whole from any number of tenths and hundredths, using number bonds to ten and one hundred and pictorial and concrete representations to help understanding.

	to the nearest whole number	- Complete part-whole models to make a whole - Find value of each digit - Use < and > to compare decimals - Put numbers in ascending/ descending order - Place decimals on a numberline to round - Complete stem sentences - **Problem solving:** - Match description to number - Use digit cards to make largest/ smallest number and statements correct - What could the number be? **Reasoning:** - Who is correct and why? - Explain thinking - Spot and correct mistakes
Summer Block 2 Measurement: Money	● estimate, compare and calculate different measures, including money in pounds and pence	**Skills**: Pupils build on their understanding of place value and decimal notation to record metric measures, including money **Vocabulary:** pounds, pence, convert, amount, change, coins, notes, cost, sum, amount, altogether, estimate, convert, change **Suggested activities:** **Fluency:** - Add amounts of money and convert between pounds and pence - Order and compare amounts of money using < > and = - Place amounts of money on a numberline - Use bar models to work out change - Complete tables **Problem solving:** - Use digit cards to create amounts - Combinations of items to buy for a certain amount - Do they have enough money? - Word problems - Using information in table/ price list to work out cost **Reasoning:** - Who is correct? - Always, sometimes, never statements and children make up their own - Would you rather…?
Summer Block 3 Measurement: Time	● convert between different units of measure [for example, kilometre to metre; hour to minute] ● read, write and convert time between analogue and digital 12-	**Skills:** Use knowledge of multiplication to convert between different units of time Children convert between analogue and digital times using format up to 12 hours. They are introduced to am and pm to distinguish between times in the morning and afternoon. Children should recognise digital times need to be written in a 4 digit format.

	and 24-hour clocks ● solve problems involving converting from hours to minutes, minutes to seconds, years to months, weeks to days	Children learn how to convert between analogue and digital times and use a numberline to explore what happens after midday. **Vocabulary:** second, minute, hour, day, week, month, year, second/ minute/ hour hand, 12/24 hour clock, analogue, digital, convert, half past, am, pm **Suggested activities:** **Fluency:** - Match activities and times - Convert amounts of time - Complete stem sentences - Complete conversion tables - Use pictures of analogue clocks to write times - Draw hands on clocks **Problem solving:** - Word problems - Using tables to calculate time intervals and work out who finishes first/ last and time differences - Use clues to work out when birthdays are - How many times will the same time be read forwards and backwards? - Reading timetables - Time dominoes **Reasoning:** - Who do you agree with/ who is correct? - True or false - Sometimes, always, never statements - Explain mistakes
Summer Block 4 Geometry: Properties of Shape	● compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes ● identify acute and obtuse angles and compare and order angles up to 2 right angles by size ● identify lines of symmetry in 2-D shapes presented in different	**Skills:** Pupils continue to classify shapes using geometrical properties, extending to classifying different triangles (for example, isosceles, equilateral, scalene) and quadrilaterals (for example, parallelogram, rhombus, trapezium). Pupils compare and order angles in preparation for using a protractor and compare lengths and angles to decide if a polygon is regular or irregular. Pupils draw symmetric patterns using a variety of media to become familiar with different orientations of lines of symmetry; and recognise line symmetry in a variety of diagrams, including where the line of symmetry does not dissect the original shape Vocabulary: properties, geometry, classify, 2 D shapes, quadrilateral, square, rectangle, trapezium, parallelogram, kite, rhombus, isosceles, equilateral, scalene, right-angled triangle, acute, obtuse, angle, right angle, degrees, line of symmetry, mirror line, symmetry, rotation, symmetrical, non-symmetrical **Suggested activities:** **Fluency:** - Sorting angles and shapes - Labelling angles and identifying angles in shapes - Completing stem sentences

	orientations ● complete a simple symmetric figure with respect to a specific line of symmetry	- Drawing angles - Use criteria to draw shapes and name them **Problem solving:** - Find sum of largest/ smallest angles - Drawing shapes - Use shapes with shapes and properties to find perimeters - Use straws to make different types of triangles- investigate - Sorting shapes into Carroll and Venn diagrams - missing labels/ children could make their own sorting diagrams - How many symmetrical shapes can you make on a square grid/ with given sides? **Reasoning:** - Who is correct? - Do you agree? - Odd one out - Which is hardest to draw and why? - Always, sometimes, never
Summer Block 5 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	**Skills:** Pupils understand and use a greater range of scales in their representations. Pupils begin to relate the graphical representation of data to recording change over time. **Vocabulary:** data, information, discrete, continuous, bar chart, time graph, line chart, pictogram, x axis, y axis, plot, table, tally, scale, interpret, compare, sum, difference, represent, value, estimate **Suggested activities:** **Fluency:** - Complete tables in graphs/ charts and tables with information given - Read and interpret information from given graphs, charts and tables - Represent data in appropriate chart/ graph - Collect data - Use addition and subtraction to answer questions about data given/ represented in a graph - Estimate time etc from line graph - Be able to tell the story of a line graph and interpret what is happening at different times - Complete stem sentences about a chart or graph - Write own questions about graph or chart **Problem solving:** - Choosing appropriate graphs to represent data - Write story to match line graph **Reasoning:** - What advice would you give someone? - Explain why choices are a good/ bad idea - Spotting mistakes - True or false? - What would be a better way of presenting this data? And why?

Summer Block 6 Geometry: Position and Direction	• describe positions on a 2-D 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	**Skills:** Pupils draw a pair of axes in one quadrant, with equal scales and integer labels. They read, write and use pairs of co-ordinates, for example (2, 5), including using coordinate-plotting ICT tools. **Vocabulary:** position, direction, coordinates, origin, x axis, y axis, quadrant grid, vertices, up, down, left right, translate, translation, plot, polygon **Suggested activities:** **Fluency:** - Create large grid on floor and get children to stand on coordinate points - Write coordinates for given points - Children write coordinates to spell their names - Draw shapes at coordinate points on a grid - Use cubes to show translation on grid - Translate points and shapes on grid - Describe translation between 2 points and shapes **Problem solving:** - Use clues to match coordinates - How many different shapes can you make plotting 3 more coordinates on grid? - Work out translation - Translation game **Reasoning:** - Who is correct? - Always, sometimes, never - Do you agree? - Spot the mistake
YEAR 5		
Strand	**Intent (Learning Questions)**	**Implementation (**Skills Progression & Activities, **Reading +** ***Vocabulary*****)**
Autumn Block 1 Number: Place value	• read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit • count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 • interpret negative numbers in	**Skills:** Pupils identify the place value in large whole numbers. They continue to use number in context, including measurement. Pupils extend and apply their understanding of the number system to the decimal numbers and fractions that they have met so far. They should recognise and describe linear number sequences, including those involving fractions and decimals, and find the term-to-term rule. They should recognise and describe linear number sequences (for example, 3, 3 ½ , 4, 4 ½ ...), including those involving fractions and decimals, and find the term-to-term rule in words (for example, add ½) **Vocabulary:** ones, tens, hundreds, thousands, ten thousands, hundred thousands, millions, place value chart, place

	context, count forwards and backwards with positive and negative whole numbers, including through 0 ● round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000 ● solve number problems and practical problems that involve all of the above ● read Roman numerals to 1,000 (M) and recognise years written in Roman numerals	value columns, compare, order, value, digit, partition, part-whole, count, greater than > less than < equal to =, round, estimate, Roman numerals, more, less, positive numbers, negative numbers, round to nearest _____, power of 10 **Suggested activities:** **Fluency:** - Match representations to numbers - Represent numbers in different ways using concrete resources and pictures/ diagrams - Show value of each digit - Complete part-whole models to partition numbers in different ways - Order numbers and placing numbers on a numberline - Use < > and = to compare numbers represented in different ways - Complete number sequences and notice patterns in number sequences - Complete tables with functions e.g. add 10, 100, 1000 - Create Roman numerals with lollipop sticks - Write numbers in words, digits and Roman Numerals - Complete table rounded to nearest 10, 100, 1000 - Estimate where positive and negative numbers would be on a numberline - Compare representations of negative numbers **Problem solving:** - Use clues to work out numbers where digits are represented by shapes/ letters - Word problems - Find all possible numbers that round to given number when rounded to nearest 10, 100 etc - Complete missing values/ digits - How many calculations can you write with the same total (roman numerals) - Use clues to find all possibilities to mystery number - Make greatest/ smallest numbers using digit cards - make number that rounds to ___ etc - Use digit cards to make numbers that fit to clues - Noticing patterns **Reasoning:** - Is he/ she correct? - Explain the mistake - Do you agree? - True or false
Autumn Block 2 Number: Addition and Subtraction	● add and subtract whole numbers with more than 4 digits, includingread, write, order and compare numbers to at least 1 000 000 and determine the value of each digit ● count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 ● interpret negative numbers in context, count forwards and backwards with positive and	**Skills:** Pupils practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency (see Mathematics appendix 1 and Queenswell Calculation Policy) They practise mental calculations with increasingly large numbers to aid fluency (for example, 12 462 – 2300 = 10 162). **Vocabulary:** Ones, tens, hundreds, thousands, ten thousands, hundred thousands, millions, digit, value, place value columns, add, , sum, increase, total, part, whole, altogether, more than, subtract, difference, less than, fewer, decrease, takeaway, equal to, balanced, is the same as, inverse, bar model, exchange, formal written method, inverse, estimate, approximate, operation, zero as place holder **Suggested activities:** **Fluency:**

	negative whole numbers, including through zero ● round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 ● solve number problems and practical problems that involve all of the above ● read Roman numerals to 1000 (M) and recognise years written in Roman numerals. using formal written methods (columnar addition and subtraction) ● add and subtract numbers mentally with increasingly large numbers ● 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	- Use concrete and pictorial representations to show and solve calculations, including exchange - Write simple stories for calculations - Choosing best questions to estimate - Using the inverse to work out 'mystery numbers' - Use bar models and part-whole models to represent calculations and show inverse relationship **Problem solving:** - Multi-step word problems - Calculation pyramids - Missing digits in calculations - Using clues find all possible numbers **Reasoning:** - Which one is inaccurate? - True or false? - Spot the mistake - Which is the most efficient method and why? - Do you agree? Explain
Autumn Block 3 Number: Multiplication and Division A	● multiply and divide numbers mentally drawing upon known facts ● multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 ● recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}) ● 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	**Skills:** They use and understand the terms factor, multiple and prime, square and cube numbers. They understand the terms factor, multiple and prime, square and cube numbers and use them to construct equivalence statements (for example, 4 x 35 = 2 x 2 x 35; 3 x 270 = 3 x 3 x 9 x 10 = 92 x 10). See Queenswell Calculation Policy for progression of mental and written methods **Vocabulary:** Place value, ones, tens, hundreds, thousands, ten thousands, hundred thousands, millions, tenths, hundredths, thousandths, multiply, multiple, factor, factor pairs, common factors, prime factors, composite numbers, prime numbers, equal groups of, commutative, repeated addition, product, lots of, divide, grouping, sharing, repeated subtraction, patterns, scaling (____ times bigger/ smaller) multiplication and division facts, scaling, formal written method, decimals, square numbers, cubed numbers **Suggested activities:** **Fluency:** - Identify multiples and factors of numbers

	composite (non-prime) numbers ● establish whether a number up to 100 is prime and recall prime numbers up to 19 ● solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes	- Write definitions for key concepts of factors, multiples, common factors, prime numbers/ posters explaining them - Use dice to make multiples and investigate which multiples can and can't be made - Find patterns in multiples and compare multiples to find links and patterns e.g. multiples of 4 and 8 - Use arrays to find and show factors of numbers, common factors and square numbers - Missing factors in calculations - Use Venn diagrams to show factors and common factors of numbers - Use multilink to make cubed numbers - Calculate square and cubed numbers - Use place value charts and concrete resources to show how digits move when you multiply or divide by a multiple of 10 - Use < > and = to compare calculations (multiplying and dividing by 10, 100 and 1000) - Use different methods to solve calculations - Use given facts to solve other calculations **Problem solving:** - Use method to find all factors of a number systematically - Find 'mystery number' using clues - Find all prime numbers between 2 numbers and explain findings/ patterns - Find the first 12 square numbers, prove they are square numbers and explain patterns - Write the questions for given answers - Word problems **Reasoning:** - Always, sometimes, never statements - True or false? - Explain mistakes and correct them - Do you agree?
Autumn Block 4 Number: Fractions A	● 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 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, ⅖ + ⅘ = 6/5 = 1 ⅕] ● add and subtract fractions with the same denominator and denominators that are multiples of the same number	**Skills:** Pupils should be taught throughout that percentages, decimals and fractions are different ways of expressing proportions. They extend their knowledge of fractions to thousandths and connect to decimals and measures. Pupils connect equivalent fractions > 1 that simplify to integers with division and other fractions > 1 to division with remainders, using the number line and other models, and hence move from these to improper and mixed fractions. Pupils connect multiplication by a fraction to using fractions as operators (fractions of), and to division, building on work from previous years. This relates to scaling by simple fractions, including fractions > 1. Pupils practise adding and subtracting fractions to become fluent through a variety of increasingly complex problems. They extend their understanding of adding and subtracting fractions to calculations that exceed 1 as a mixed number. Pupils continue to practise counting forwards and backwards in simple fractions. Pupils continue to develop their understanding of fractions as numbers, measures and operators by finding fractions of numbers and quantities. Pupils extend counting from year 4, using decimals and fractions including bridging zero, for example on a number line. **Vocabulary:** fraction, whole, part, equal, divide, share, unit/ non-unit fraction, numerator, denominator, half, third,

	• multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams • 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, ⅖ + ⅘ = 6/5 = 1 ⅕] • 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.	quarter, fifth, tenth, equivalent, common denominator, decimal, quantity, whole number, ascending, descending, compare, multiples, mixed number, improper fraction, simplify, convert, multiply, decimal notation, scaling, sequence **Suggested activities:** **Fluency:** - Use paper and fold to find equivalent fractions - Explore equivalent fractions using models and concrete representations (paper folds, cuisenaire, fraction walls, multilink, numicon, bar models, shapes) - Children use multiplication and division to find equivalent fractions - Represent improper fractions physically and visually and group (cubes, bar models etc) - Use counting sticks and numberlines to count up and down in fractions - Complete sequences of fractions - Use bar models to compare and order fractions - Use < > and = to compare fractions - Use bar models to add and subtract fractions - Explaining each step of a calculation - Record answers as improper fractions and mixed numbers **Problem solving:** - Using algebra in equivalent fractions e.g. calculate value of c - Fill in missing numbers - How many possibilities can you find? - How many different ways can you find? - Fraction games - Word problems - Can you find more than one answer? **Reasoning:** - Recognising whether methods work or not - Do you agree? Explain your answer - Spot the mistake - Do you agree? - Who is correct? - Always, sometimes, never statements - Which method so
Autumn Block 5 Number: Multiplication and Division B	• 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 • solve problems involving addition,	**Skills:** Pupils practise and extend their use of the formal written methods of short multiplication and short division (see Mathematics appendix 1 and Queenswell Calculation Policy) They apply all the multiplication tables and related division facts frequently, commit them to memory and use them confidently to make larger calculations. Pupils interpret non-integer answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding (for example, 98 ÷ 4 = 4 98 = 24 r 2 = 24 2 1 = 24.5 ≈ 25). Pupils use multiplication and division as inverses to support the introduction of ratio in year 6, for example, by multiplying and dividing by powers of 10 in scale drawings or by multiplying and dividing by powers of a 1000 in converting between units such as kilometres and metres.

	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	Pupils use and explain the equals sign to indicate equivalence, including in missing number problems (for example, 13 + 24 = 12 + 25; 33 = 5 x). **Vocabulary:** place value columns, ones, tens, hundreds, thousands, ten thousands, hundred thousands, millions, tenths, hundredths, multiply, multiple, factor, factor pairs, common factors, prime factors, composite numbers, prime numbers, equal groups of, commutative, repeated addition, product, lots of, divide, grouping, sharing, repeated subtraction, patterns, scaling (____ times bigger/ smaller), power of 10, multiplication and division facts, scaling, formal written method, short division, remainder, equivalence, equals **Suggested activities:** **Fluency:** - Use concrete resources and pictures to represent 4 digit x 1 digit numbers (showing exchange when necessary) - Use Diennes and place value counters to show 2 digit x 2 digit - Compare representations of calculations and follow and use different representations - Use the formal written method for multiplication to solve calculations. - Complete missing steps in a method - Use formal written method to calculate area - Use < > and = to compare calculations - Use concrete resources and pictures to show short division and making groups of **Problem solving:** - Work out missing digits in calculations - Word problems - Notice patterns in calculations and use this to solve other calculations e.g. x 111 - Write number stories/ word problems for calculations - What is my number? **Reasoning:** - Explain mistakes - Do you agree? Prove it - Who is correct? What mistake has been made? - Spot the mistakes - Always, sometimes, never statements
Spring Block 1 Number Fractions B (New Scheme)		-
Spring Block 2 Number: Decimals and percentages	● 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	**Skills:** Pupils extend counting from year 4, using decimals and fractions including bridging zero, for example on a number line. Pupils say, read and write decimal fractions and related tenths, hundredths and thousandths accurately and are confident in checking the reasonableness of their answers to problems. They mentally add and subtract tenths, and one-digit whole numbers and tenths.

	places to the nearest whole number and to one decimal place ● solve problems involving number up to three decimal places ● recognise the percent 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 ½ , ¼ , ⅕ , ⅖ , ⅘ and those fractions with a denominator of a multiple of 10 or 25.	They practise adding and subtracting decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1 (for example, 0.83 + 0.17 = 1). Pupils should go beyond the measurement and money models of decimals, for example, by solving puzzles involving decimals. Pupils should make connections between percentages, fractions and decimals (for example, 100% represents a whole quantity and 1% is 1/100, 50% is 50/100 , 25% is 25/100) and relate this to finding 'fractions of'. **Vocabulary:** whole number, decimal**,** ones, tenths, hundredths, thousandths, decimal point, place value, digit, decimal place, value, decimal equivalents, compare, round, order, ascending, descending, percent (out of one hundred), fraction, parts, whole, partition, add, subtract, percentages of amounts **Suggested activities:** **Fluency:** - Represent decimals in place value chart use place value counters and Diennes - Complete stem sentences about decimals saying how many tenths and hundredths and thousandths - Write down value of underlined digit - Use hundred squares to represent decimals as fractions - Prove that _____ decimal and ___ fraction is the same using pictorial representations - Use models to record equivalent decimals and fractions - Identify decimals on numberline and write equivalent fractions or mixed numbers - Complete table to represent decimals in different ways - Use numberline to round to nearest tenth and whole number - Use < > and = to compare decimals and fractions - Place decimals on numberline in ascending order - Use hundred squares to represent percentages and relate to fractions and decimals - Use bar models to show percentages - Complete tables to show percentage, decimal and fraction equivalents - Convert between fractions, decimals and percentages **Problem solving:** - Find different ways of partitioning decimal numbers (using part-whole models) - Match descriptions to numbers - Use digit cards to make decimal numbers - Write numbers in 3 different ways - Symbols to represent numbers - Word problems involving rounding - Mystery number - '____ is thinking of a number' - Complete tables of scores and percentages **Reasoning:** - Odd one out - Prove a statement doesn't always work - Do you agree? Explain your reasoning - Who is correct? Explain why - Complete the stem sentences 'It could be…' 'It must be…' 'It can't be…' - Is he correct?
Spring Block 3	● measure and calculate the	**Skills:** Pupils calculate the perimeter of rectangles and related composite shapes, including using the relations of perimeter

Measurement: Area and Perimeter	perimeter of composite rectilinear shapes in centimetres and metres ● calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes	or area to find unknown lengths. Missing measures questions such as these can be expressed algebraically, for example 4 + 2b = 20 for a rectangle of sides 2 cm and b cm and perimeter of 20cm. Pupils calculate the area from scale drawings using given measurements. **Vocabulary:** Length, distance, width, unit of measurement, centimetres, metres, millimetres, kilometres, perimeter, rectilinear, square, rectangle, dimensions, area, cm^2 and m^2, multiply, unit of measurement, convert, regular and irregular shapes, compound shapes **Suggested activities:** **Fluency:** - Measure the perimeter of shapes (without grid) - Find perimeter of shapes with missing dimensions - Use formula to calculate area - Approximate area of shapes and put them in order smallest to largest - Find area of compound shapes and different ways you can do this - Estimate area **Problem solving:** - Construct shapes on grids with given area/ perimeter - Investigate different shapes you can make with same perimeter/ area - Use algebra to work out perimeter of shape with missing dimensions - Word problems - Find approximate area of shapes and put them in order smallest to largest - Find area of shapes made up of smaller shapes (using information given) - How many different ways can you split compound shape to find the area? - Make maps to show different approximate areas on square grid **Reasoning:** - How do you know? What do you notice? - What strategy would you use to investigate the rectangles and squares you can make with a given area
Spring Block 4 Statistics	● solve comparison, sum and difference problems using information presented in a line graph ● complete, read and interpret information in tables, including timetables.	**Skills:** Pupils connect their work on coordinates and scales to their interpretation of time graphs. They begin to decide which representations of data are most appropriate and why. **Vocabulary:** data, information, discrete, continuous, bar chart, time graph, line chart, pictogram, x axis, y axis, plot, table, tally, scale, intervals, interpret, compare, sum, difference, represent, value, estimate, timetable, column, row **Suggested activities:** **Fluency:** - Use data in real life contexts - answering questions about data presented in line graphs - Explore line graphs with different scales - Complete/ draw graphs from data given in tables - choosing own scale - Collect own data to be shown in line graph - Estimating time and values from line graphs - Use tables to answer questions - find information in a table

		- Answer questions using timetables **Problem solving:** - Match the graph to the story/ activity - Plot missing scales and points on graph - Make up own questions for partner to answer about graph/ table - Work out missing information from tables and graphs - What does the graph/ chart tell you or not tell you? **Reasoning:** - True or false? - Do you agree?
Summer Block 1 Geometry: Properties of Shape	● identify 3-D shapes, including cubes and other cuboids, from 2-D representations ● 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 360°) - angles at a point on a straight line and ½ a turn (total 180°) - other multiples of 90o - 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.	**Skills:** Pupils become accurate in drawing lines with a ruler to the nearest millimetre, and measuring with a protractor. They use conventional markings for parallel lines and right angles. Pupils use the term diagonal and make conjectures about the angles formed between sides, and between diagonals and parallel sides, and other properties of quadrilaterals, for example using dynamic geometry ICT tools. Pupils use angle sum facts and other properties to make deductions about missing angles and relate these to missing number problems. **Vocabulary:** properties, geometry, identify and classify, 2 D shapes, quadrilateral, square, rectangle, trapezium, parallelogram, kite, rhombus, isosceles, equilateral, scalene, right-angled triangle, 3D shapes, cube, cuboid, pyramid, prism, faces, edges, vertices, net, acute, obtuse, angle, right angle, reflex, degrees, protractor, angles at a point, turn, clockwise, anti-clockwise, angles on a straight line, regular and irregular polygons, equal sides, equal angles **Suggested activities:** **Fluency:** - Use stem sentences to describe turns and angles on a clock/ compass - Describe turns in different ways - as types of angles, degress, and fractions of whole turn - Estimate size of angles and use a protractor to measure angles and identify types of angle - Draw lines and angles accurately using ruler and protractor - Calculate missing angles using knowledge of right angles, angles on a straight line, angles in a whole turn - Calculate angles in shapes - Match nets of shapes to 3D shapes - Use polydron to create nets of different 3D shapes - Complete and draw nets **Problem solving:** - Use mathematical language to describe turns on a compass to partner and they guess where turn will finish - Making angles with a spinner - Use artwork by Kandinsky to measure angles and create clues to describe which angle you have measured - Use clues to calculate sizes of angles and write own problem for partner - Use algebra to write number sentences about unknown angles - Calculate angles and perimeters of composite shapes - Sort shapes using Carroll and Venn diagrams according to their properties - Represent 3D shapes from different viewpoints **Reasoning:**

		- Which one is the odd one out? Why? - Always, sometimes, never statements - Who do you agree with? Explain why - Spot and explain the mistake - Use and compare different methods - What is the same? What is different? - Do you agree? Why?
Summer Block 2 Geometry: Position and direction	● 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.	**Skills:** Pupils recognise and use reflection and translation in a variety of diagrams, including continuing to use a 2-D grid and coordinates in the first quadrant. Reflection should be in lines that are parallel to the axes. **Vocabulary:** position, direction, coordinates, origin, x axis, y axis, quadrant grid, vertices, up, down, left right, translate, translation, plot, polygon, reflection, mirror line, symmetrical **Suggested activities:** **Fluency:** - Plot co-ordinate points on a grid - Write the co-ordinates of points of grid (including vertices of shapes) - Identify diagrams that show reflections - Reflect shapes in mirror line (including on co-ordinate grids) using mirrors and counting squares - Write co-ordinates of reflected shapes - Draw shapes after translation - Describe translations of shapes - Translate co-ordinates **Problem solving:** - What do you notice? Spotting patterns when plotting co-ordinates with same total - Describing reflections - Is there more than one answer to the problem? - Write coordinates of translated shapes - Work out missing co-ordinates for translated shapes - What are co-ordinates of shape before translation? **Reasoning:** - Who do you agree with? Why? - Are they correct? Why? - Do you agree? Explain your reasoning - Spot the mistake
Summer Block 3 Number: Decimals	● multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 ● convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)	**Skills:** Pupils use their knowledge of place value and multiplication and division to convert between standard units. Pupils use all four operations in problems involving time and money, including conversions **Vocabulary:** whole number, decimal, tenth, hundredth, thousandth, add, subtract, sum, multiply, divide, place value, digit, sequence, term, increase, decrease, convert, units of measurement, kilometre, metre, centimetre, millimetre, gram, kilogram, litre, millilitre, pounds, pence, length, mass, volume, money, scaling, decimal place, decimal point. **Suggested activities:** **Fluency:** - Use place value charts to represent and add and subtract decimals

	• use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling. • solve problems involving number up to three decimal place	- Use numberline to find difference between two decimal numbers - Use 100 square, part-whole models and numberline to find complements which sum to make 1 - Use different methods when adding and subtracting decimals (including formal written method) - Complete sequences and write rules for sequences - Generate first 5 terms of a sequence using a rule - Use place value chart to x and ÷ by 10, 100 and 1000 - Complete stem sentences explaining what happens to digits when x and ÷ by 10, 100 and 1000 - Fill in missing numbers and operations in calculations - **Problem solving:** - Find missing digits in calculations - Word problems - Find path through maze by adding decimals - Word problems (in context of measure and money) - Use digit cards to complete calculations - Complete the number pyramid using inverse - Sort calculations into table - Mystery numbers in envelopes (have to work out using clues) - Comparing sequences - Noticing patterns **Reasoning:** - What mistake has been made? - Decide which calculations are the easiest/ most difficult to answer and why - Do you agree?
Summer Block 4 Number: Negative Numbers (New Scheme)	•	-
Summer Block 5 Measurement: Converting units	• convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) • 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	**Skills:** Pupils use their knowledge of place value and multiplication and division to convert between standard units. Pupils use all four operations in problems involving time and money, including conversions (for example, days to weeks, expressing the answer as weeks and days). **Vocabulary:** whole number, decimal, multiply, divide, place value, convert, units of measurement, kilometre, metre, centimetre, millimetre, gram, kilogram, litre, millilitre, pounds, pence, length, mass, volume, money, scaling, decimal place, decimal point, metric unit, imperial unit, miles, pints, inches, pounds (mass), time, seconds, minutes, hours, days, weeks, years, time intervals, difference, equivalence **Suggested activities:** **Fluency:** - Find missing values on double numberline (e.g. g and kg) - Complete stem sentences and number sentences to show equivalent measurements - Use < > and + to compare measurements - Measure objects in real life and convert - Put measurements in ascending/ descending order

		- Use bar models to convert imperial and metric measurements - Complete tables with conversions - Retrieve information from timetables and calculate time intervals using a numberline **Problem solving:** - Multi-step word problems - Identify which conversions can be completed by dividing by 1000 - Complete conversion diagrams - Make own timetable of school day **Reasoning:** - What is the same and what is different? - Are they correct? Explain
Summer Block 6 Measurement: Volume	● estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water] ● use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.	**Skills:** Pupils understand that volume is the amount of solid space that something takes up and understand the difference between volume and capacity. Pupils use their understanding of volume to compare and order solids made of cubes. Pupils estimate the volume and capacity of different solids and objects and choose correct units of measurement. . Pupils should understand that containers can be different shapes but have the same capacity. **Vocabulary:** volume, millilitre, litre, capacity, estimate, scale, cube, cuboid, cm^2, m^2, length, mass, volume **Suggested activities:** **Fluency**: - Make different shapes with a set number of 1cm cubes. What is the same? What is different? - Make shapes and complete table to show and compare height, width, length and volume - Use stem sentences to compare capacity and volume - Work out and compare the volumes of different shapes - Order shapes based on their volume (in ascending or descending order) - Use < > and = to compare volume of shapes - Match objects to approximate capacities - Estimate capacity of objects around the classroom - Practically investigate capacity of different containers using rice/water **Problem solving:** - How many possible ways can you find to make a cuboid with volume $12cm^3$? - Use clues to decide what a shape might look like - Missing sections of model - Use clues to decide what the shape could look like **Reasoning:** - Is she correct? Explain your answer - Do you agree? Explain your answer
YEAR 6		
Strand	**Intent (Learning Questions)**	**Implementation (Skills Progression & Activities + Vocabulary)**

Autumn Block 1 Number: 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.	**Skills:** Pupils use the whole number system, including saying, reading and writing numbers accurately. **Vocabulary:** ones, tens, hundreds, thousands, ten thousands, hundred thousands, millions, place value chart, place value columns, compare, order, value, digit, partition, part-whole, count, greater than > less than < equal to =, round, estimate, Roman numerals, more, less, positive numbers, negative numbers, intervals, round to nearest _____, power of 10 **Suggested activities:** **Fluency:** - Match representations to numbers - Recognise the value of digits in numbers - Partition numbers using calculations, part whole models and bar models - Use < and > to compare numbers - Write all numbers that round to a given number - Use numberlines and pictures to add and subtract positive and negative numbers **Problem solving:** - Use digit cards and statements to work out a mystery number - Fill in missing digits - Word problems - Find all solutions to a problem - Work out missing number from clues - Word problems **Reasoning:** - Are they correct? Explain how you know - Explain which representation is the most accurate - Explain the mistake - Do you agree? Explain why - Can you find examples to prove a statement and explain why it happens?
Autumn Block 2 Number: Four operations	• 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 long division, and interpret remainders as whole number remainders, fractions,	**Skills:** Pupils practise addition, subtraction, multiplication and division for larger numbers, using the formal written methods of columnar addition and subtraction, short and long multiplication, and short and long division (see Mathematics Appendix 1 and Queenswell Calculation policy). They undertake mental calculations with increasingly large numbers and more complex calculations. Pupils continue to use all the multiplication tables to calculate mathematical statements in order to maintain their fluency. Pupils round answers to a specified degree of accuracy, for example, to the nearest 10, 20, 50 etc., but not to a specified number of significant figures. Pupils explore the order of operations using brackets; for example, 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9. Common factors can be related to finding equivalent fractions. **Vocabulary:** Ones, tens, hundreds, thousands, ten thousands, hundred thousands, millions, digit, value, place value columns, add, , sum, increase, total, part, whole, altogether, more than, subtract, difference, less than, fewer,

	or by rounding, as appropriate for the context • divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context • 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 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 • use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.	decrease, takeaway, equal to, balanced, is the same as, inverse, bar model, exchange, formal written method, inverse, estimate, approximate, operation, zero as place holder, tenths, hundredths, multiply, multiple, factor, factor pairs, common factors, prime factors, composite numbers, prime numbers, equal groups of, commutative, repeated addition, product, lots of, divide, grouping, sharing, repeated subtraction, patterns, scaling (____ times bigger/ smaller), power of 10, multiplication and division facts, scaling, formal written method, short division, long division, remainder, equivalence, equals, order of operations **Suggested activities:** **Fluency:** - Use formal written methods to add and subtract large numbers - Calculate missing digits in calculations - Use numberlines to find the difference between 2 numbers - Use formal written method for multiplication - Write missing numbers in calculations - Calculate using short division - Use factors for division - noticing patterns and using different strategies/ methods - Use different methods for long division before calculating using formal written method - Find common factors/ common multiples/ prime factors of numbers - List all prime numbers - Use < > and = to make statements correct - Explain relationships you can see between numbers - Explore order of operations and how position of brackets changes answer - Solve calculations using order of operations (BIDMAS) - Add brackets to calculations to make them correct - Choose the most efficient mental strategies - Use understanding of known facts to solve a similar calculation (not using a formal written method) **Problem solving:** - Word problems - Find missing values in a bar model using clues - Place digits in boxes to create largest/ smallest product - Find the difference between 2 calculations - Use algebra to work out missing values in bar models - Spotting patterns - Find all possible answers - Work out headings in a Venn/ carroll diagram or place numbers into sorting diagrams - Work out numbers using clues - Play countdown and write calculation using order of operations - Write different number sentences using order of operations **Reasoning:** - True or false? - Do you agree? Explain why - Odd one out - Spot the mistake - Which question is harder? Explain why - Who is correct? Explain your answer - Which number is the odd one out? Explain why - Which method is the most efficient?

Autumn Block 3 Number: Fractions A	• use common factors to simplify fractions; use common multiples to express fractions in the same denomination • compare and order fractions, including fractions > 1 • 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 [for example, 4 1 × 2 1 = 8 1] • divide proper fractions by whole numbers [for example, 3 1 ÷ 2 = 6 1] • associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 8 3] • recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. • generate and describe linear number sequences (with fractions)	**Skills:** Pupils should practise, use and understand the addition and subtraction of fractions with different denominators by identifying equivalent fractions with the same denominator. They should start with fractions where the denominator of one fraction is a multiple of the other (for example, 2 1 + 8 1 = 8 5) and progress to varied and increasingly complex problems. Pupils should use a variety of images to support their understanding of multiplication with fractions. This follows earlier work about fractions as operators (fractions of), as numbers, and as equal parts of objects, for example as parts of a rectangle. Pupils use their understanding of the relationship between unit fractions and division to work backwards by multiplying a quantity that represents a unit fraction to find the whole quantity (for example, if 4 1 of a length is 36cm, then the whole length is 36 × 4 = 144cm). They practise calculations with simple fractions and decimal fraction equivalents to aid fluency, including listing equivalent fractions to identify fractions with common denominators **Vocabulary:** fraction, whole, part, equal, divide, share, unit/ non-unit fraction, numerator, denominator, half, third, quarter, fifth, tenth, equivalent, common denominator, decimal, quantity, whole number, ascending, descending, compare, multiples, mixed number, improper fraction, simplify, convert, multiply, decimal notation, scaling, sequence **Suggested activities:** **Fluency:** - Use fraction walls, bar models, cuisenaire to simplify fractions - Place fractions on a numberline - Use < > and = to compare fractions - Use bar models to compare fractions and complete stem sentences - Use diagrams/ shading and numberlines to add and subtract fractions - Complete part whole models - Complete calculations involving fractions - Match calculations to correct answer - Use order of operations in fraction calculations - Use bar models to find fractions of amounts **Problem solving:** - Draw numberline to plot fractions - How many different ways can you show the difference between 2 fractions on a numberline? - Word problems - Use digit cards to complete statements involving fractions - Compare test scores given as fractions to say who did better - Complete calculations using digit cards - Given answer, have to decide on what the question could have been - Use given information (algebra) to complete calculation and find value of x - How many ways can you answer? - Find area when dimensions are written as fractions - Add brackets to make calculation correct **Reasoning:** - Identify which method has been used - Do you agree? Explain why - Always, sometimes, never statements - Explain whether you think a method/ strategy is effective or not

		- Explain your method - Are they correct? Explain your reasoning
Autumn Block 4 Number: Fractions B (New Scheme)		
Autumn Block 5 Measurement: Converting Units	● 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 three decimal places ● convert between miles and kilometres	**Skills:** Pupils connect conversion (for example, from kilometres to miles) to a graphical representation as preparation for understanding linear/proportional graphs. They know approximate conversions and are able to tell if an answer is sensible. Pupils could be introduced to compound units for speed, such as miles per hour, and apply their knowledge in science or other subjects as appropriate. Pupils should be taught the meaning of ~ as approximately equal to **Vocabulary:** whole number, decimal, multiply, divide, place value, convert, units of measurement, kilometre, metre, centimetre, millimetre, gram, kilogram, litre, millilitre, pounds, pence, length, mass, volume, money, scaling, decimal place, decimal point, metric unit, imperial unit, miles, pints, inches, pounds (mass), time, seconds, minutes, hours, days, weeks, years, time intervals, difference, equivalence **Suggested activities:** **Fluency:** - Choose the most appropriate units to measure items - Estimate measurements - Use tables and stem sentences to convert measurements in both directions - Order measurements - Complete missing measurements to make statements correct **Problem solving:** - Word problems **Reasoning:** - Do you agree? Explain why - Explain why ____ is wrong
Spring Block 1 Number: 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 the	**Skills:** Pupils recognise proportionality in contexts when the relations between quantities are in the same ratio (for example, similar shapes and recipes). Pupils link percentages or 360° to calculating angles of pie charts. Pupils should consolidate their understanding of ratio when comparing quantities, sizes and scale drawings by solving a variety of problems. They might use the notation a:b to record their work.

	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.	Pupils solve problems involving unequal quantities, for example, 'for every egg you need three spoonfuls of flour', ' 5 3 of the class are boys'. These problems are the foundation for later formal approaches to ratio and proportion. Pupils should understand that ratio shows the relationship between two values Pupils use multiplication and division to use scale factors and find missing information **Vocabulary:** ratio, proportion, relationship, value, quantity, comparisons, 'for every', fractions, relative size, scale factor, enlarge, factors, multiples, **Suggested activities:** **Fluency:** - Complete stem sentences to describe pictures using 'for every' - Write representations as ratio and fractions - Use pictures to write ratios and draw pictures to show ratios - Use bar models to represent ratios - Redraw simple shapes using scale factor e.g. 5 times bigger, scale factor 3 - Use stem sentences to describe enlargements - Use multiplication and division to find missing scale factors **Problem solving:** - Continuing and explaining patterns - Word problems - use bar models to represent ratio - Compare the area, perimeter and angles of enlarged shapes **Reasoning:** - True or false? - Which is the odd one out? Explain your answer - Explain which statements are correct or incorrect - Do you agree? Explain why - Always, sometimes, never statements
Spring Block 2 Number: 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.	**Skills:** Pupils should be introduced to the use of symbols and letters to represent variables and unknowns in mathematical situations that they already understand, such as: ● missing numbers, lengths, coordinates and angles ● formulae in mathematics and science ● equivalent expressions (for example, a + b = b + a) ● generalisations of number patterns ● number puzzles (for example, what two numbers can add up to). **Vocabulary:** algebra, equation, formulae/ formula, expression, linear sequence, unknown, value, represent algebraically, generate, missing value, variables, function (one-step, two-step), input, output, substitute/ substitution **Suggested activities:** **Fluency:** - Use function machines, exploring input and output and writing missing functions - Use cubes/ physical resources/ pictures to introduce children to writing algebraic expressions - Use shapes and letters and substitute numbers into expressions

		- Identify formulas and use formulas to calculate perimeters of shapes and costs - Represent word problems using algebra - Write down and solve equations represented in diagrams - Match equations to bar models - Find all possible solutions to an equation (variables) **Problem solving:** - How many answers can you find? - Create own function machine - Identify which two-step function machines can be written as one-step function machines - Use 2 formulae to work out values - Match formula to problem - Use trial and improvement to find mystery number - Write a word problem to describe an equation - Form equations to show what is represented in diagrams and solve to find missing value **Reasoning:** - Are they correct? Explain - Do you agree? Explain your answer - Why is ____ wrong? Explain - Who do you agree with? Why? - What is the same and what is different? - How can you check your answer?
Spring Block 3 Number: Decimals	● identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places ● multiply one-digit numbers with up to two decimal places 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	**Skills:** Pupils can explore and make conjectures about converting a simple fraction to a decimal fraction (for example, 3 ÷ 8 = 0.375). For simple fractions with recurring decimal equivalents, pupils learn about rounding the decimal to three decimal places, or other appropriate approximations depending on the context. Pupils multiply and divide numbers with up to two decimal places by one-digit and two-digit whole numbers. Pupils multiply decimals by whole numbers, starting with the simplest cases, such as 0.4 × 2 = 0.8, and in practical contexts, such as measures and money. Pupils are introduced to the division of decimal numbers by one-digit whole number, initially, in practical contexts involving measures and money. They recognise division calculations as the inverse of multiplication. Pupils also develop their skills of rounding and estimating as a means of predicting and checking the order of magnitude of their answers to decimal calculations. This includes rounding answers to a specified degree of accuracy and checking the reasonableness of their answers **Vocabulary:** whole number, decimal**,** ones, tenths, hundredths, thousandths, decimal point, place value, digit, decimal place, value, decimal equivalents, round, fraction, parts, whole, partition, add, subtract, remainder, multiply, divide **Suggested activities:** **Fluency:** - Use counters and place value charts to represent decimals - Write the value of digits in decimal numbers - Use place value charts to multiply and divide decimals by 10, 100 and 1000 - Fill in missing numbers in multiplication and division calculations

		- Complete tables of multiplying and dividing by 10, 100 and 1000 - Use concrete resources (place value counters and charts) to represent multiplication of decimal number by integer - Complete stem sentences to show steps taken to multiply or divide decimal numbers - Use different methods of grouping and sharing to divide decimal numbers - Use different representations to show decimals as fractions - Match fractions to decimal equivalents - Convert fractions and decimals using pictorial representations and dividing numerator by denominator - Use short division to find fraction and decimal equivalents **Problem solving:** - Match decimal numbers to clues - What patterns do you notice? - Use rules in a table to find missing numbers - Can you find a path across a function grid? - Word problems - Fill in missing digits in calculations - Use algebraic clues to complete calculations - Use digit cards to complete number sentences **Reasoning:** - Do you agree? Explain your thinking - Who do you agree with? Why? - Odd one out - True or false? Explain your reasoning - Explain why you have used a certain method - Who is correct? Prove it
Spring Block 4 Number: Fractions, Decimals and 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 fractions, decimals and percentages, including in different contexts.	**Skills:** Pupils learn how to convert fractions to equivalent fractions out of 100 to find percentage equivalents Pupils use their knowledge of common equivalent fractions and decimals to find equivalent percentage Pupils use known fractional equivalences to find percentages of amounts and explore different methods of finding percentages of amounts using different fraction equivalents Pupils use their understanding of percentages to find the missing whole or a missing percentage when other values are given **Vocabulary:** percent (out of one hundred), decimal and fraction equivalents, compare, percentage of amount, **Suggested activities:** **Fluency:** - Use hundred square to show fraction and percentage equivalents - Complete missing values to make statements about equivalent fractions and percentages correct - Complete tables to show fraction, decimal and percentage equivalents - Use < > and = to complete statements - Match equivalent fractions, decimals and percentages - Order fractions, decimals and percentages - Complete stem sentences to show the steps needed to find a percentage of an amount - Use bar models to find percentages of amounts

		Problem solving: - Work out scores on a test. Who answered more questions correctly? - How many different ways can you complete a part-whole model? - Use digit cards to make all possible fractions and convert to decimal and percentage equivalents - Word problems - Complete the missing numbers to make statements correct - How many ways can you find ____% of given number? - Write questions about a given model **Reasoning:** - Who do you agree with? Explain your reasoning - Explain why ____ is wrong - Who do you agree with? Explain your answer - Who has used the most efficient method?
Spring Block 5 Measurement: Perimeter, Area and Volume	● 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 cubic centimetres (cm3) and cubic metres (m3), and extending to other units [for example, mm3 and km3].	**Skills:** They relate the area of rectangles to parallelograms and triangles, for example, by dissection, and calculate their areas, understanding and using the formulae (in words or symbols) to do this. Using the number line, pupils use, add and subtract positive and negative integers for measures such as temperature. **Vocabulary:** volume, millilitre, litre, capacity, estimate, scale, cube, cuboid, cm^2, m^2, length, width, base, height, volume,, width, unit of measurement, centimetres, metres, millimetres, kilometres, perimeter, rectilinear, square, rectangle, dimensions, 3d shapes, 2d shapes, area, cm^2 and m^2, multiply, unit of measurement, convert, regular and irregular shapes, compound shapes, formula, area of triangle, area of parallelogram **Suggested activities:** **Fluency:** - Sort shapes into Venn and Carroll diagrams according to their properties - Draw shapes to certain specifications - Find shapes with the same area/ perimeter - Work out missing dimensions of shapes - Estimate and calculate the area of triangles and parallelograms by counting squares - Use formula to calculate the area of triangles and parallelograms - Count cubes to find the volume of shapes and make shapes with cubes that have a specific volume - Complete stem sentences to show steps needed to find the volume to cubes and cuboids - Calculate volume of cubes and cuboids using formula - Find missing dimensions from given volume **Problem solving:** - Work out shapes from clues given, finding all possibilities - Investigate - what do you notice? Can you find any other examples that follow the same pattern/ do not follow the pattern? - Work out the area of compound shapes - How many shapes can you make with the same volume? Find all possibilities **Reasoning:** - Who is correct? Explain your reasoning

		- Always, sometimes never statements - True or false? - What is the same and what is different? - Do you agree? Explain your answer - Follow different methods and explain which are correct and incorrect - Spot the mistake
Spring Block 6 Statistics	● interpret and construct pie charts and line graphs and use these to solve problems calculate and interpret the mean as an average. ● illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius	**Skills:** Pupils connect their work on angles, fractions and percentages to the interpretation of pie charts. Pupils both encounter and draw graphs relating two variables, arising from their own enquiry and in other subjects. They should connect conversion from kilometres to miles in measurement to its graphical representation. Pupils know when it is appropriate to find the mean of a data set. **Vocabulary:** data, set of data, information, discrete, continuous, bar chart, time graph, line chart, pictogram, x axis, y axis, plot, table, tally, scale, intervals, interpret, compare, sum, difference, represent, value, estimate, timetable, column, row, pie charts, percentages, mean as an average, radius, diameter, circumference, centre **Suggested activities:** **Fluency:** - Answer questions by retrieving information and interpreting line graphs - Create line graphs from given data in a table - Label/ match parts of a circle - Find the radius/ diameter of circles using the link between these - Use fractions and percentages of amounts to answer questions about pie charts - Construct pie charts **Problem solving:** - Write stories and questions for line graphs - Compare graphs - Labelling axes of line graphs - how many different ways could you label the axes? - Use one circle to find radius and diameter of smaller circle that is fraction of the size - Write questions about pie chart - Put information from a pie chart into a table **Reasoning:** - What is the same and what is different? - Can you spot the mistakes? - Who is correct? Explain how you know? - Is _____ right? Explain - Explaining methods - Do you agree? Explain why
Summer Block 1 Geometry: Properties Of Shape	● draw 2-D shapes using given dimensions and angles ● recognise, describe and build simple 3-D shapes, including making nets ● compare and classify geometric	**Skills:** Pupils draw shapes and nets accurately, using measuring tools and conventional markings and labels for lines and angles. Pupils describe the properties of shapes and explain how unknown angles and lengths can be derived from known measurements. These relationships might be expressed algebraically for example, $d = 2 \times r$; $a = 180 – (b + c)$.

	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.	**Vocabulary:** properties, geometry, identify and classify, 2 D shapes, quadrilateral, square, rectangle, trapezium, parallelogram, kite, rhombus, isosceles, equilateral, scalene, right-angled triangle, 3D shapes, cube, cuboid, pyramid, prism, faces, edges, vertices, net, acute, obtuse, angle, right angle, reflex, degrees, protractor, angles at a point, turn, clockwise, anti-clockwise, angles on a straight line, regular and irregular polygons, interior/ internal angles, equal sides, equal angles, radius, diameter, circumference **Suggested activities:** **Fluency:** - Identify type of angle, estimate and measure using protractor - Complete tables identifying angles in turns and using compass points - Use algebra to make number sentences using knowledge of angles on a straight line, at a point and right angles - Calculate missing angles - Find missing angles in different types of triangle (using properties) - Calculate missing angles in quadrilaterals - Investigating interior angles in regular and irregular polygons and noticing patterns - Draw shapes accurately using rulers and protractors to measure sides and angles - Write step by step instructions on how to draw shapes accurately - Match nets and 3d shapes - Draw nets **Problem solving:** - Word problems - Pie chart problems - Use clues to work out missing angles - Find all possible answers - Use clues to identify the types of shapes being described - How many quadrilaterals can you make on a geoboard? - Use polydron to investigate the nets of 3d shapes and record investigation systematically **Reasoning:** - Explain mistakes - Always, sometimes, never statements - Who is correct? Explain - Draw diagrams to prove or explain thinking - True or false? - Can ___ be correct? Explain - Give reasons for your answers - What is the same, what is different? - Disprove statements with examples
Summer Block 2 Block Geometry: Position and direction	● describe positions on the full coordinate grid (all four quadrants) ● draw and translate simple shapes on the coordinate plane, and reflect them in the axes.	**Skills:** Pupils draw and label a pair of axes in all four quadrants with equal scaling. This extends their knowledge of one quadrant to all four quadrants, including the use of negative numbers. Pupils draw and label rectangles (including squares), parallelograms and rhombuses, specified by coordinates in the four quadrants, predicting missing coordinates using the properties of shapes. These might be expressed algebraically for example, translating vertex (a, b) to (a – 2, b + 3); (a, b) and (a + d, b + d) being opposite vertices of a square of side d.

		Vocabulary: position, direction, coordinates, origin, x axis, y axis, quadrant grid, vertices, up, down, left right, translate, translation, plot, polygon, reflection, mirror line, symmetrical **Suggested activities:** **Fluency:** - Plot given co-ordinates and write co-ordinates of points - Plot vertices of shapes on co-ordinate grid - Work out missing co-ordinates of vertices of shapes - Describe translations of co-ordinate points and shapes on a grid - Write co-ordinates of shape after translation or reflection **Problem solving:** - Use properties of shapes to find missing co-ordinates of vertices - Where could the shape have been before translation/ reflection? Find all possible answers **Reasoning:** - Mark work and correct mistakes - True or false? - Spot the mistake - Is she correct? Explain why