Garswood Mathematics Curriculum Map 2023

At Garswood we have a bespoke approach to teaching mathematics using a combination of White Rose schemes, NCTEM and additional resources to ensure the most effective and carefully selected curriculum suits the individual needs and learning styles of the children. Each specific objective taught is split up into the areas below to ensure a step-by-step approach to mastering a concept and becoming fluent in the factual knowledge and components surrounding this....

I know that.... (components) – facts (Declarative)

- Number bonds, times tables, instant recall of facts, quick fire, associated facts, repeated calculations. Sticky knowledge at speed.

I know how.... (components) – methods (Procedural)

- The process and procedure needing to solve a calculation. Steps needed to be taken to reach the end goal. Logical and systematic.

I know when.... (composite) – strategies (Conditional)

- Facts and methods go together to make up the strategy. Normally requires some planning ahead by the child of how they are going to solve a problem.

I know why... only at the very end of the unit. – (Conceptual)

Mathematics Intent:

Maths is a journey and long-term goal, achieved through exploration, clarification, practice and application over time. At each stage of learning, children should be able to demonstrate a deep, conceptual understanding of the topic and be able to build on this over time. We are aiming for deep learning when components stick and can be transferred and applied in different concepts. And Deepest learning which can be transferred and applied in different contexts. The deep and deepest levels are what we are aiming for by teaching maths using a variety of resources including White Rose for sequencing and teaching resources, NCTEM for small steps to follow to embed mastery and a variety of self-styled and adapted resources to ensure declarative knowledge sticks. . At Garswood, we aim to develop children's oracy and utilise opportunities to extend children's vocabulary across the curriculum. We help every student develop as a whole person, fulfil their potential and contribute towards a future built upon the social and economic wellbeing of the individual, the local community and the wider world.

Mathematics Implementation:

- The specific Year group maps outlines below are within our shared staff drives and available to all staff. This provides an amalgamation of White Rose small steps, NCTEM spines and Ready to Progress materials. One scheme alone would not cater for all learning, so we've combined a range to accommodate all needs and learning styles.
- The **learning end points** signify the learning we want children to have by the end of the block. The **Composite NC knowledge** show how each block ensure the statutory National Curriculum objectives are being covered in each block.
- The **KIRFs** show a half term specific objective to be taught ten minutes daily in a variety of ways to ensure this knowledge and associated links 'stick' with children and they become completely secure with this knowledge at their age-related ability. The **Declarative Sticky Knowledge** are the instant recall and associated facts we will repeat and reteach until we are confident children have a firm and secure understanding before moving onto composite concepts.
- The **NCTEM Big Ideas** are how to ensure that mastery is covered within the unit and the learning is embedded within the child's knowledge so they can use this to making connections between other mathematical areas **with links** below to Gareth Metcalfe materials and Mastery questioning to provide resources for consolidation and challenging the more able in each block.
- The map then moves onto the small steps of White Rose teaching in the **White Rose Documents** where each small step is hyperlinked to a separate document and broken down into key areas of reasoning, fluency and problem solving for each objective. This ensures children can accommodate the learning for that objective in a range of ways. With **NRich links** to pose specific challenging problems that often benefit from discussion of objectives for the more auditory learners.
- Concluding with the **NCTEM key questions and STEM sentences** that can be repeated in any block or unit such as true or false, spot the mistake, do then explain, what do you notice etc.... however, examples specific to this particular block are focused on under each heading.

Mathematics Impact:

At Garswood, we ensure that all students are exposed to rich learning experiences both in and out of the classroom that aims to:

- Allow children to make quick recall of facts and procedures
- Develop a flexibility and fluidity to move between different contexts and representations of mathematics.
- Develop an ability to recognise relationships and make connections in mathematics.
- Overcome the vocabulary deficit by regularly being exposed to a range of maths vocabulary and ensuring the words are in context.
- Ensure the children feel prepared to use their knowledge of key mathematical concepts to contribute to the society around them and the wider world.
- A mathematical concept or skill has been mastered when a child can show it in multiple ways, using the mathematical language to explain their ideas, and can independently apply the concept to new problems in unfamiliar situations.
- Children demonstrate quick recall of facts and procedures as outlined in the half termly SIRF objectives. This includes the recollection of the times tables.
- Children show confidence in believing that they will achieve.
- Children show a high level of pride in the presentation and understanding of the work

National Curriculum Knowledge:

	Declarative Concepts, facts, representations, and vocabulary	Procedural Methods can be applied quickly, accurately and using minimal steps	Conditional Using declarative facts that have been rehearsed and combined with procedural methods
Early Years	numbers and number bonds to 10; concepts and vocabulary for talking about maths and mathematical patterns (size, weight, capacity, quantity, position, distance, time)	accurate counting, single digit addition and subtraction, halving doubling and sharing	play games/sing songs answer questions talk about everyday objects solve problems using objects within continuous provision
Years 1 and 2	simple fractions **basic arithmetic:** the numbering system and its symbols, place value, conventions for expressions and equations, counting, addition, subtraction, equal sharing, doubling, balancing simple arithmetic equations, classifying numbers (odd, even, teens), inverse operations, estimation, numerical patterns **basic measurement:** length; capacity; time; position; relative size, position, direction, motion, quantity Currency and coinage **Basic geometry:** 2D and 3D shapes, geometric patterns Categorical data **Maths's facts:** all number bonds within and between 20; key number bonds within and between 100, all multiplication facts for the 2, 5 and 10 multiplication tables, key 'fraction facts' such as 'half of 6 is 3', key 'time facts' such as the number of minutes in an hour	counting up and down in 1s, 2, 5s, 10s and 1/2s; addition; subtraction, equal sharing, division and multiplication reading, writing of the digits/symbols, vocabulary and phrases required for working with simple fractions, arithmetic expressions and equations measuring length, capacity, time and monetary value presentation and layout of calculations using a ruler spotting and making geometric and numerical patterns construction and interpretation of categorical data: pictograms, charts, tables	Complete written exercises Solve missing number problems Solve simple word problems involving arithmetic, money, time and fractions Solve data and measurement problems
Years 3 and 4	**Arithmetic:** enhanced knowledge of the code for number (to 1000s) including patterns and as-sociated rules for addition and subtraction of numbers, decimal numbers, place value, negative numbers, associative and distributive laws **Maths's facts:** all multiplication facts for the 3, 4, 6, 7, 8, 9, 11, 12 multiplication tables, decimal equivalents of key fractions equivalent fractions **Formulae:** Units of measurement conversion rules, formulae for perimeter and area Roman Numeral system and associated historical facts **Geometry facts:** right angles, acute and obtuse angles, right angles in whole and half turns, symmetry, triangle and quadrilateral classifications; horizontal, perpendicular, parallel and perpendicular lines Links between words/phrases in word problems and their corresponding operations in mathematics (e.g. 'spending' is associated with 'subtraction from an amount') The rules for multiplying and dividing by 10, 100 and 1000 First quadrant grid coordinate principles	counting up and down in multiples of 3, 4, 6, 7, 8, 9, 11, 12, 25, 50, 100, 1000, in tenths, in ones through to negative numbers Column addition and subtraction Mental addition and subtraction using patterns and rules of number Short division and multiplication Mental multiplication using derived facts Fractions: finding unit and non-unit fractions of amounts, common equivalents, addition, subtraction and comparison of fractions with the same denominator measure, compare, add, subtract: lengths, mass, capacity (all units of measurement) read, write and compare roman numerals Draw 2D and 3D shapes Interpret and present data Estimation and rounding First quadrant grid construction, plotting and translation of points	Complete written exercises Solve missing number, length problems Solve word problems in-volving arithmetic, fractions, data handling, shape, length, mass and capacity
Years 5 and 6	Enhanced knowledge of the code for number: up to and within 1 000 000, multiples, factors, decimals, prime number facts to 100, composite numbers, indexation for square and cubed numbers Properties of linear sequences Conversion facts metric to imperial measurements and vice versa Key circle, quadrilateral and triangle facts and formulae (e.g. angles on a straight line sum to 180 degrees) Rules and principles governing order of operations	Scaling, coordinate geometry in all four quadrants Division with remainders as fractions, decimals and where rounding is needed Fractions: conversion mixed to improper and vice versa, add, subtract and multiply Finding percentages of amounts Converting units of measurement Measurement of length, angles, area, perimeter, volume Use of order of operations Convert between fractions, decimals and percentages Linear algebra, basic trigonometry Long multiplication and division	Complete written exercises Find missing quantities, lengths, angles Solve one- and two-step word problems involving all the operations Abstract and solve linear equations from word problems

Maths Curriculum Map – Nursery - EYFS

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

***At Garswood** we use both Birth to 5 Matters and Development Matters non statutory guidance to enable us to make a holistic best fit judgement for observation, assessment and next steps. We understand that all children are unique, and that they develop in different ways. We nurture and encourage this using a play-based approach. We use the statutory Early Learning Goals to assess children at the end of Reception as Emerging or Expected.*

Nursery Mathematics	• To know routines • Know how to count to 3 in sequence • Know how to count to show how many • Know some basic shapes • Know focused daily nursery rhymes	• To know routines using now and next • To know counting and pointing out the last number • Collecting objects • To know finger rhymes to 5 • To know and link numerals to amounts • Know to sort and categorise objects • Know simple positional language to find objects	• To follow instructions first, then • Know positional language to describe a simple route around classroom • Know numerals through play and blank tracks • Experience real life maths problems during routines • Comparing amounts • Explore small 2D and 3D shape play	• To describe an event • Know positional language to describe a simple route beyond the classroom • Know simple prepositions • Explore large 2D and 3D shape play • Explore and know there are patterns around us	• Know the sequence of a simple story • Know we can compare lengths • Know we can compare weights • Know language of first, then, next to talk about trip • Know numeral amounts and count accurately in play	• Know the sequence stories in play • Know positional language whilst on a journey around our community • Know there are patterns in other cultures • Know, copy and create simple patterns e.g. stripes • Know and copy musical patterns
	• Baseline: counting, sorting, basic shapes. • Know we can count objects in sequence (forwards, backwards, using actions and through songs and games) • Know focused nursery rhymes involving numbers and counting. • Know how when we count objects, we point out the last object to show how many • Introducing basic shapes in focus and play. Point out names of shapes circle, square, triangle. Use in play. Know some names. • Know the routines in sequence. E.g. coat away, bag away, then play.	• Know when we count objects, pointing out the last number shows how many. • Know a variety of number games and collect a specific number of items. • Know finger numbers up to 5. Know how to show me on fingers and singing number rhymes up to 5. • Know and link numerals and amounts throughout the setting. Show and point out in focus. Introduce independence in play. • Know how to sort objects by size and capacity (for example vehicles or different sized containers) • Know how to categorise toys and objects by colour. Know how to sort into different groups using this criteria. • To know routines when asked questions like now and next. • Know positional language to play hide and seek. Hide a toy and use language like 'under'.	• Know how to subitise up to 3 – play games to include 1, 2, 3 objects. • Explore numerals and blank tracks through play and practitioner modelling. • Introduce real world mathematical problems with numbers up to 5 during, snack time, group time etc. be very clear and use visuals to enable children to solve the simple question. E.g we have 5 children at the table. How many cups do we need? We have 3 children how many chairs do we need? Children know they can physically count the children / chairs and physically hand out the objects and count together. • Know simple visual comparisons introducing more than and fewer than. Which table has more children? Who has fewer blocks? Use numbers within 5 and visually count out. Children know they must move an object to count. • Exploring 2D and 3D shapes through play activities. Know they can make pictures and models with shapes and discuss shapes as we play. • To know routines and follow a sequence first, then, next. • Know positional language to plan a 'route' for example a route from the classroom to the hall. (Not a map – a journey)	• Know prepositions in real life contexts. Introduce in focus activities and then model and support in play. E.g. in, on, under. • Know positional language to plan a 'route' / 'journey' to the trip on the farm. (Not a map) • Know we can use loose parts for den making, talking about shapes and how their properties suit the purpose. • To know a sequence of events like a trip or family event. • Know and search for patterns around us. Use loose parts to copy simple patterns.	• Know we can compare lengths and weights (vegetables, farm animals). Long / short, big / small, heavy, light. Explore with hands. • Use photographs from our trip to the farm to talk about real life events. Know to talk about what we did throughout the day using, 'first, then, next' language. • Know we can link numerals to amounts accurately in both focused activities and opportunities in play. • Know a sequence in a simple story first, then, next.	• Know there are simple patterns from different cultures e.g fabrics. Introduce vocabulary to describe patterns. • Know and describe a pattern we see, copy a pattern and create their own patterns using a variety of materials • Create musical patterns using clapping and stamping. • Know and sequence a story or event in their play. • Know positional language on a walk around our community. Make a journey plan. (No a map)
Educational	Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.					

	We will be learning to	Through activities such as	Throughout the year the children will learn	
	• Follow the nursery routine • Listen to number songs and rhymes • Number names and shapes	• Sequencing of the day – visual timetable • Days of the week song • Counting children in line as line up • How many people live in my house?	• To count through songs, stories and in their play • To recognise quantities of objects • To recognise numerals in the environment • To use some number names and language • To show awareness of numbers in the environment • To explore 2d shapes in the environment • To show awareness of time through class routines	• To compare objects by size • To recite number rhymes • To explore different shapes, spaces and measures • To recognise without counting (subitise) how many objects there are in a set (1 – 3) • To use fingers and marks on paper to represent numbers • To count objects, sounds or actions

Birth to 5 Matters

Number EYFS

Comparison
- Compares two small groups of up to five objects, saying when there are the same number of objects in each group, e.g. You've got two, I've got two. Same!

Counting
- May enjoy counting verbally as far as they can go
- Points or touches (tags) each item, saying one number for each item, using the stable order of 1,2,3,4,5.
- Uses some number names and number language within play, and may show fascination with large numbers
- Begin to recognise numerals 0 to 10

Cardinality
- Subitises one, two and three objects (without counting)
- Counts up to five items, recognising that the last number said represents the total counted so far (cardinal principle)
- Links numerals with amounts up to 5 and maybe beyond
- Explores using a range of their own marks and signs to which they ascribe mathematical meanings

Composition
- Through play and exploration, beginning to learn that numbers are made up (composed) of smaller numbers
- Beginning to use understanding of number to solve practical problems in play and meaningful activities
- Beginning to recognise that each counting number is one more than the one before
- Separates a group of three or four objects in different ways, beginning to recognise that the total is still the same

Shape, Space Measures EYFS

Spatial Awareness
- Responds to and uses language of position and direction
- Predicts, moves and rotates objects to fit the space or create the shape they would like

Shape
- Chooses items based on their shape which are appropriate for the child's purpose
- Responds to both informal language and common shape names
- Shows awareness of shape similarities and differences between objects
- Enjoys partitioning and combining shapes to make new shapes with 2D and 3D shapes
- Attempts to create arches and enclosures when building, using trial and improvement to select blocks

Pattern
- Creates their own spatial patterns showing some organisation or regularity

Developmental Matters

- Fast recognition of up to 3 objects, without having to count them individually ('subitising').
- Recite numbers past 5.
- Say one number for each item in order: 1,2,3,4,5.
- Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').
- Show 'finger numbers' up to 5.
- Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.
- Experiment with their own symbols and marks as well as numerals.
- Solve real world mathematical problems with numbers up to 5.

- Compare quantities using language: 'more than', 'fewer than'.
- Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'.
- Understand position through words alone – for example, "The bag is under the table," – with no pointing.
- Describe a familiar route.
- Discuss routes and locations, using words like 'in front of' and 'behind'.
- Make comparisons between objects relating to size, length, weight and capacity.
- Select shapes appropriately: flat surfaces for building, a triangular prism for a roof etc.
- Combine shapes to make new ones – an arch, a bigger triangle etc.
- Talk about and identifies the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs' etc.

Maths Curriculum Map – Reception - EYFS

Educational Programme from: *Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.*

Counting Principles:

- The One-One Principle - I can count each object only once and say one number name for each object.
- The Stable Order Principle - When I count, I say the numbers in order. This order always stays the same.
- The Cardinal Principle - When I count the objects in a group, the last number I say tells me the total for the group.
- The Abstraction Principle - I can count anything. Even things that cannot be touched or seen.
- The Order-Irrelevance Principle - It doesn't matter which order I count a group of objects in, the total will be the same.

At Garswood *we use both Birth to 5 Matters and Development Matters non statutory guidance to enable us to make a holistic best fit judgement for observation, assessment and next steps. We understand that all children are unique, and that they develop in different ways. We nurture and encourage this using a play-based approach. We use the statutory Early Learning Goals to assess children at the end of Reception as Emerging or Expected.*

	Entry												End
Mathematics	• To know practitioners, peers and the classroom environment and routines • Explore the environment and know how to sort and match amounts and objects. • Know how to compare size, mass and capacity • Know patterns are around us and we can explore , make, repeat them	• Know how to represent, compare and compose 1, 2, 3 • Know and have an awareness of number 4 – 5 • Know positional language and simple shapes. • Know how to represent numbers to 5. • Know 1 more 1 less within 5. • Know some shapes with 4 sides • Know time linked to our daily routines	• Introducing zero – to know how zero is represented • Know how to compare numbers to 5. • Know the composition of 4 and 5 • Know how to compare mass and capacity • Know how to count to 6, 7, 8 • Know how to combine 2 amounts • Know how to make pairs	• Know how to measure length and height • Know how to sequence time • Know how to count to 9, 10. • Know how to compare numbers up to 10. • Know number bonds to ten on ten frame. • Know number bonds to 10 part whole model. • Know spatial awareness when building with shapes and knowing which stack, roll etc... • Know some simple 3D shapes • Know how to recognise and repeat patterns	• Know how to verbally count to 20 and beyond. • Know how to build numbers beyond 10 • Know how to counting patterns beyond 10 • Know spatial reasoning when rotating to fit a space • Know how to match, rotate, manipulate • Know how we add more and take away • Know spatial reasoning when combining shapes to make new shapes. • Know how to compose and decompose to make new shapes and pictures	• Know the meaning of doubling • Know the meaning of sharing and grouping • Know odds and evens within 10 • Know spatial reasoning when building and using positional language to create models • Know how to visualise and build accurately • Deepening understanding of patterns and relationships • Know spatial reasoning in the creation of more complex patterns and transient art. • Know how to create a simple maps

Rec Mathematics SK						
	*Opportunities to settle children in and introducing the areas of provision and getting to know the children. Children to be formally introduced to each area of provision and then know how to play, rules routines of each area and the know peers and practitioners can help them. *Children to know routines, key times of the day, explore inside and outside and sort and tidy areas. Adults to model and teach children. *Know how to match, sort and compare amounts. Know how to explore the maths area and match and sort numicon, blocks, counters. Know how to sort objects based on attributes throughout the provision. Know to consider same and different. Know line up time activities. *Know to sort collections of objects into sets. Know to compare more, fewer the same. *Know how to compare size, mass and capacity. Children know to compare heights of each other by standing together. Children know to compare weights of objects by holding them and using a balance. Children know to compare capacity by filling different sized containers. Activities to continue in Continuous provision and time utilising all resources	*Children know representations of 1, 2, 3. They subitise or count to find out how many and make their own collections of 1, 2 and 3 objects *They know how to match the number names we say to numerals and quantities. *They know how to count to 3 objects in different arrangements by touching each object as they count and recognise that the final number, they say names the quantity of the set. *They know how to use their own marking making to represent 1, 2 and 3, for example recording their score in a game. *They know and understand as we count each number is 1 more. They know counting back is 1 less than the previous number. Support children to do this in play and compare numbers. *They know and understand that numbers are made up of smaller numbers. Know and explore the composition of 2 and 3. Children may explore the composition of larger numbers. *Know about circles and triangles. That circles have 1 curved side and triangles have 3 straight sides. They begin to recognise these shapes in everyday objects. They begin to build their own circles and triangles. They explore different sizes, side lengths and orientations. *Know positional language to describe where they are. They build life-sized journeys and travel through them. They represent their journeys using simple models, drawings or maps. *Know how to count on and back to 4 and count, subitise and make collections of 4 objects. Know how to match numeral to quantity and compare quantities and are able to say which have more or fewer. They mark make to represent 4. *Know and subitise to 5 and count forwards and backwards accurately using the counting principles. They represent 5 objects on 5 frames and know if full it is 5. Focus on 5th birthdays and 5 number rhymes.	*Know the number name 'zero' or 0 can represent 'nothing' or 'all gone'. Sing number songs that count back e.g. 10 green bottles, 5 elephants. Understand 0 is less than 1. *Know how to compare numbers to 5 understanding that quantities can be more than, less than or the same. Support children to compare quantities in their play. *Know that numbers are made up of smaller numbers. E.g. 4 is 1 and 3. Encourage subitising and show children that numbers can be made up of 2 parts or more than 2 parts. *Know by holding items we can compare weight. Know to use a balance to check predications. Know language heavier, heavier than, heaviest and lighter, lighter than and lightest. Address misconception that heavier is always bigger. *Revisit capacity and know language empty, half full, full, nearly empty. Explore with water, sand, rice and beans. Use different sized and shaped containers. Know language tall, thin, narrow, wide, shallow. Pour and compare. Use smaller containers to count e.g. cups or ladles. *Continue to represent the counting principle with 6, 7, 8. Arrange smaller numbers in groups to enable children to subitise and see how 6, 7, 8 are made up. E.g. 8 is 4 and 4. Know how to order and compare numbers noticing more and less patterns as we count on and back.	*Know language to compare length and height. Use language specific to length (longer, shorter), height (taller, shorter), breadth (wider, narrower). Begin to use nonstandard units of measure to compare. *Know how to sequence time using language such as now, before, later, soon, after, then, next. To talk about each week in terms of today, yesterday, tomorrow. To understand things, they are looking forward to and learn about time through stories and vegetable growth. *Know the counting principles with 9 and 10, forwards and backwards. They arrange and represent 9 and 10 in different ways using skills of subitising and exploring composition. E.g. 9 is 3, 3, 3. A ten frame is full when it has 10. They have 10 fingers. *To know that a set of items can have more, fewer or the same than other sets. Compare 2 then 3 or more quantities. *Know bonds to 10 using real objects or ten frames or 10-hole egg boxes. Discuss how many and how many more to make 10? *Know how to manipulate shapes in play. Which shapes stack or roll? Why? Model and encouraging building with 3D shapes. Discuss names as we model. Discuss similarities and differences and sort shapes.	*Know to use resources (E.g. ten frames, blocks, numicon, bead strings, loose parts, base 10) to build and identify numbers of objects to 20. Show children the numbers 1-9 repeat after 10. E.g. 1 and 10 is 11. *Know to count on and back beyond 10. Show how we have 1 ten and 4 is 14. Count on and back from different starting points. Say what comes before and after. Challenge to find numbers on a 100 square. * Know how to use puzzles and jigsaws. Know how to select and rotate to fit spaces. *Know and tell stories using first, then, now and talk about adding more. Represent number stories using ten frames, fingers and number lines. *Know and tell stories using first, then, now model and talk about taking away. Encourage counting out, taking away and subitising what's left. Represent number stories using ten frames, fingers and number lines. • *Know shapes can be combined and separated to make new shapes. Explore and investigate how many different shapes we can make	*Know that double means 'twice as many'. Build doubles using objects and maths resources. Use mirrors to explore symmetry. Build up doubles in patterns. *Know to share equally and unequally. Explain they are not shared fairly. How to we resolve when things are not shared fairly? *Know that some objects can be shared or grouped fairly in groups of 2. Some won't. Some objects can be grouped in pairs. Model odd and even structures and pair wise patterns on the 10 frame. *Know positional language when creating models. Provide verbal instructions to build. Play barrier games to build the same. Is it the same? *Know problem solving linked to real life problems and stories. Follow up and support in play. Encourage children to consider different starting points and outcomes. *Know how to use a range of resources throughout the classroom to model and challenge children to create patterns ABBBC and repeat. More complex transient art. • *Know how to make maps and plans to

	where appropriate throughout the provision. *Know patterns and explore patterns. Model pattern making using different resources throughout the classroom. Encourage children to explore and create. Children know how to create AB patterns.	* Know how to use 5 frames to represent numbers and predict how many there will be if they add 1 more or 1 less. Show links with counting forwards and 1 more and counting backwards and 1 less. *Know rectangles and squares have 4 straight sides and 4 corners. Recognise these shapes within the classroom and make them. Explore a variety of sizes and orientations. • *Know about night and day and order routines. Know and use language to describe when events happen. E.g. day, night. Measure time in simple ways e.g. counting sleeps or using sand timers.	*Know that combining 2 groups we see how many altogether. Use in context using real objects. Encourage subitising and counting in ones. • *Build on pair work matching pairs by arranging small quantities in pairs and know sometimes there is an odd one or one left out. Play matching pairs games like snap and memory games.	• *Know AB pattern. Know and explore ABB, BAA, AABB, BBAAA. Ensure each model has 3 full units of repeat. Model patterns in straight lines and around the edge of shapes. Link to transient art.	smaller shapes from a give shape.	represent things in relation to others. Make maps and plans of the models they have built indoors and out.
Vocab	more, less, add, take away, greater, fewer, tall, taller, big, little, middle size, small, medium, long, short, tiny, large, centimetres, thickest, enormous, heavy, heavier, light, lightest, full, empty, half full, enough, next to, between, behind, under, in front, over, high, on top, up, in, on, first, second, third, fourth, far away, today, tomorrow, day after, Friday, Saturday, early, evening, pm, morning, yesterday, night, calendar, 1p, pounds, enough, bill, change, amount, costs, circles, hexagons, square, rectangle, triangle, diamond, sphere, sides, corners, flat, curved, pattern.			**Continuous Provision**	Mathematics to be supported though rhymes, stories both during focused activities and in play. The maths area to be available at all times. Children to have access to mathematical opportunities in all areas of learning, inside, outside and during Forest School sessions. Staff to use opportunities to focus on individuals who require further support. Staff to be aware of individuals unique learning needs and interests. Interventions to take place during play and also separate focused time.	
Counting Principles	• The One-One Principle - I can count each object only once and say one number name for each object. • The Stable Order Principle - When I count, I say the numbers in order. This order always stays the same. • The Cardinal Principle - When I count the objects in a group, the last number I say tells me the total for the group. • The Abstraction Principle - I can count anything. Even things that cannot be touched or seen. The Order-Irrelevance Principle - It doesn't matter which order I count a group of objects in, the total will be the same.					
Educational Prog from EYFS Framework	Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.					

	Number EYFS		Shape, Space Measures EYFS
Birth to 5 Matters	**Comparison** • Uses number names and symbols when comparing numbers, showing interest in large numbers • Estimates of numbers of things, showing understanding of relative size Counting • Enjoys reciting numbers from 0 to 10 (and beyond) and back from 10 to0 • Increasingly confident at putting numerals in order 0 to 10 (ordinality) **Cardinality** • Engages in subitising numbers to four and maybe five • Counts out up to 10 objects from a larger group • Matches the numeral with a group of items to show how many there are (up to 10) **Composition** • Shows awareness that numbers are made up (composed) of smaller numbers, exploring partitioning in different ways with a wide range of objects • Begins to conceptually subitise larger numbers by subitising smaller groups within the number, e.g. sees six raisins on a plate as three and three • In practical activities, adds one and subtracts one with numbers to 10 Begins to explore and work out mathematical problems, using signs and strategies of their own choice, including (when appropriate) standard numerals, tallies and "+" or "-"		**Spatial Awareness** • Uses spatial language, including following and giving directions, using relative terms and describing what they see from different viewpoints • Investigates turning and flipping objects in order to make shapes fit and create models; predicting and visualising how they will look (spatial reasoning) • May enjoy making simple maps of familiar and imaginative environments, with landmarks **Shape** • Uses informal language and analogies, (e.g. heart-shaped and hand-shaped leaves), as well as mathematical terms to describe shapes • Enjoys composing and decomposing shapes, learning which shapes combine to make other shapes • Uses own ideas to make models of increasing complexity, selecting blocks needed, solving problems and visualising what they will build **Pattern** • Spots patterns in the environment, beginning to identify the pattern "rule" • Chooses familiar objects to create and recreate repeating patterns beyond AB patterns and begins to identify the unit of repeat **Measures** • Enjoys tackling problems involving prediction and discussion of comparisons of length, weight or capacity, paying attention to fairness and accuracy • Becomes familiar with measuring tools in everyday experiences and play • Is increasingly able to order and sequence events using everyday language related to time • Beginning to experience measuring time with timers and calendars
Develop Matters	• Count objects, actions and sounds • Subitise. • Link the number symbol (numeral) with its cardinal number value. • Count beyond ten.	• Compare numbers. • Understand the 'one more than/one less than' relationship between consecutive numbers. • Explore the composition of numbers to 10. • Automatically recall number bonds for numbers 0–10.	• Select, rotate and manipulate shapes in order to develop spatial reasoning skills. • Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can. • Continue, copy and create repeating patterns. • Compare length, weight and capacity.
ELG	• Have a deep understanding of number to 10, including the composition of each number. • Subitise (recognise quantities without counting) up to 5. • Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts. • Verbally count beyond 20, recognising the pattern of the counting system. • Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity. • Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.		

Maths Curriculum Map – Year 1 (Autumn)

Number		Geometry		Measure	

	Block 1 Week 1-5	Block 2 Week 6 - 10	Block 3 Week 11	Week 12
	Place Value (within 10)	**Addition and Subtraction (within 10)**	**Shape**	
KIRFs	**To know how to read and wite to ten in numerals**	**To know number bonds for each number to 10**		
vocab	Digit, numerals, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, zero, one, two, three.....	What is 3 **add** 7? What is 2 **plus** 2?	What is 5 **take away** 2? What is 1 **less than** 8?	
Declarative SK	• number bonds [2, 3, 4, 5, 6, 7, 8, 9 and 10] • count forwards and backwards in ones from a given two-digit number • add and subtract one single digit with another single digit	• add three single digits, spotting pairs which make 10 • find one more and one less		
Learning End Points (White Rose)	Sort objects. Count objects. Represent objects. Count, read and write forwards from any number 0 to 10. Count, read and writing backwards 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.	Part whole model. Addition symbol.. Fact families – Addition facts. Find number bonds for numbers within 10. Systematic methods for number bonds within 10. Number bonds to 10. Compare number bonds. Addition: Adding together. Addition: Adding more. Finding a part. Subtraction: Taking away, how many left? Crossing out. Subtraction: Taking away, how many left? Introducing the subtraction symbol. Subtraction: Finding a part, breaking apart. Fact families – The 8 facts. Subtraction: Counting back. Subtraction: Finding the difference. Comparing addition and subtraction statements a + b > c. Comparing addition and subtraction statements a + b > c + d.	Recognise and name 3D shapes. Sort 3D shapes. Recognise and name 2D shapes. Sort 2D shapes. Patterns with 3D a nd 2D shapes.	**Consolidation**
Procedural NC know	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.	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.	Recognise and name common 2-D shapes, including: (e.g. rectangles (including squares), circles and triangles). Recognise and name common 3-D shapes, including: (e.g. cuboid (including cubes), pyrami ds and spheres).	
Specific block Vocab	Sort, group, number track, digit, pattern, one more, one less, matched, fewer, greater than (>), less than (<), equal to (=), most, least, fewest, greatest, number line, order, tens (10s), ones (1s), more, smallest, number bond, fact family, compare, 100 square, number square, place value grid.	Group, plus, part-whole model, whole, part, number sentence altogether, in total, add, count on, missing part, how many ar left?, in total, taken away, subtract, subtraction, addition, cou backwards, How many more?, How many fewer?, difference.	3D, cube, cuboid, sphere, pyramid, cylinder, cone, 2D, circle, triangle, square, rectangle, face, repeated.	

NCTEM STEM sentences	**The Big Ideas** The position a digit is placed in a number determines its value. The language used to name numbers does not always expose the place value, for example the word 'twelve' does not make it transparent that the value of this number is ten and two. It is important that children develop secure understanding of the value of each digit. Place value is based on unitising: treating a group of things as one 'unit'. In mathematics, units can be any size, for example units of 1, 2, 5 and 10 are used in money. In place value units of 1, 10 and 100 are used.	**The Big Ideas** Relating numbers to 5 and 10 helps develop knowledge of the number bonds within 20. For example, given 8 + 7, thinking of 7 as 2 + 5 and adding the 2 to 8 to make 10 and then the 5 to total 15. Thinking of part whole relationships is helpful in linking addition and subtraction. For example, where the whole is 6, and 4 and 2 are parts. This means that 4 and 2 together form the whole, which is 6 and 6 subtract 4 leaves the 2 and 6 subtract 2 leaves the 4	**The Big Ideas** It is important for children to be familiar with a range of 2-D and 3-D shapes and not just recognise them in specific orientations, e.g. thinking that this is a triangle but this or this are not . It is preferable to introduce 3-D shapes before 2-D shapes, since 2-D shapes only exist in the real world as faces of 3-D shapes. An emphasis should be placed upon identifying and describing the properties of shapes. It is important that pupils develop the correct mathematical language to do so. The development of precise language to describe position and movement is important.
Links	**Teaching for Mastery Year 1** **I See Reasoning – GM**	**Teaching for Mastery Year 1** **I See Reasoning – GM**	**Teaching for Mastery Year 1** **I See Reasoning – GM**
White Rose Documents	**Mental Recall:** count to and across 40, forwards and backwards, beginning with 0 or 1, or from any given number count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number **Within 10: Count objects** **Within 10: Counting forwards** **Within 10: count backwards** **Within 10: Counting forwards and backwards** **Within 20: Count and write numbers to 20** **Within 50: Numbers to 50** **Counting to 100** □ count forwards from 80 to 110 □ count backwards from 105	**Mental Recall:** represent and use number bonds and related subtraction facts within 20 **Within 10: Part whole model** **Within 10: Fact families – Addition facts** **Within 10: Find number bonds within 10** **Within 10: Systematic number bonds** **Within 10: Number bonds to 10** **Within 10: Compare number bonds** **Within 10: Fact families – The 8 facts** **Within 20: Find and make number bonds** **Within 20: Related facts** Use the pattern to complete the number sentences. Now do the same for rows of 6 counters, 7 counters, 8 counters, 9 counters and 10 counters Recall all number bonds to and witihin 10. Exposing the structure of the mathematics supports this process. They should then apply this to number bonds to 20, so if 5 + 3 = 8, 15 + 3 = 18 □ I'm thinking of a number. I've subtracted 6 and the answer is 8. What number was I thinking of? Explain how you know. □ I'm thinking of a number. I've added 7 and the answer is 18. What number was I thinking of? Explain how you know. □ I know that 6 and 4 is 10. How can I find 7 + 4? How could you work it out?	**Properties of 2D:** Recognise and name common 2-D, including [for example] rectangles (including squares), circles, and triangles. **Recognise and name 2D shapes** **Sort 2D shapes** *Give each child a shape -* *Give each child two different shapes* Tell me something that is the same about these. Now tell me something that is different about these. One shape has 2 long sides and 2 short sides. Tick it **Properties of 3D:** Recognise and name common 3-D shapes, including [for example] rectangles (including squares), circles, triangles, cuboids (including cubes), pyramids and spheres. **Recognise and name 3D shapes** **Sort 3D shapes** **Patterns with 3D and 2D shapes** Look at the shape I have given you. Tell me one thing about the shape. *Hand each child a solid -* Child A: cylinder Child B: triangular prism Child C: cone Child D: cube Look at what I have given you. Tell me one thing about it. *Give each child two different solids.* Tell me something that is the same about these. Now tell me something that is different about these. Fred draws round the bottom of a cone.
Nrich links	**1** **2** **3** **4**	**1** **2** **3** **4** **5** **6** **7**	**1** **2** **3** **4**
NCTEM conditional knowledge	**Spot the mistake:** 5,6,8,9 What is wrong with this sequence of numbers? **True or False?** I start at 2 and count in twos. I will say 9 **What comes next?** 10+1 = 11, 11+1= 12, 12+1 = 13 **Do, then explain** Look at the objects (in a collection). Are there more of one type than another? How can you find out?	**Convince me** In my head I have two odd numbers with a difference of 2. What could they be? Convince me **Missing numbers** Fill in the missing numbers (using a range of practical resources to support) 12 + = 19 20 - = 3 **Fact families** Which four number sentences link these numbers? 12, 15, 3 **What else do you know?** If you know; 12 – 9 = 3 what other facts do you know? **Missing symbols** Write the missing symbols (+ - =) in these number sentences: 17 3 20 18 20 2 **Working backwards** Through practical games on number tracks and lines ask questions such as "where have you landed?" and "what numbers would you need to throw to land on other given numbers?" **What do you notice?** 11 – 1 = 10 11 – 10 = 1 Can you make up some other number sentences like this involving 3 different numbers? **Continue the pattern** 10 + 8 = 18 11 + 7 = 18 Can you make up a similar pattern for the number 17? How would this pattern look if it included subtraction? **Missing numbers** 9 + = 10 10 - = 9 What number goes in the missing box? **Making an estimate** Pick (from a selection of number sentences) the ones where the answer is 8 or 9. **Is it true that?** Is it true that 3+4 = 4 + 3?	**What's the same, what's different?** Find a rectangle and a triangle in this set of shapes. Tell me one thing that's the same about them. Tell me one thing that is different about them. **Visualising** Put some shapes in a bag. Find me a shape that has more than three edges. **True or false?** All 2-D shapes have at least 4 sides **Other possibilities** Can you find shapes that can go with the set with this label? "Have straight sides"

Maths Curriculum Map – Year 1 (Spring)

Number		Geometry		Measure	

	Block 1 Week 1-3	Block 2 Week 4 - 6	Block 3 Week 7 - 8	Block 4 Week 9 - 10	Block 5 Week 11 - 12
	Place Value (Within 20)	**Addition and Subtraction**	**Place Value (Within 50, m of 2, 5, 10)**	**Length and height**	**Weight and volume**
KIRFs	**To know how to compare numbers to ten using < > =**		**To know how to count in 2's and know doubles an halves to 10**		
vocab	greater than, compare, less than equal to	e.g. 4 < 7 means that 4 is less than 7 2 + 3 is equal to 5	two, four, six, eight double, half, part of, share	Share the flowers into groups, how many in each group?	
Declarative SK	• count to and across 100, forwards and backwards • add by putting the largest number first • represent and use number bonds and related subtraction facts within 20		• Understand the concept of equality for the = sign [2 = 1 + 1 / 2 + 3 = 4 + 1] • begin to count in multiples of 2s, 5s and 10s • begin to say what three times 5 is by counting in 5s		
Learning End Points (White Rose)	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.	Subtraction – Crossing 10 (1). Subtraction – Crossing 10 (2). Related Facts. Add by counting on. Find and make number bonds. Add by making 10. Subtraction – Not crossing 10. Compare Number Sentences.	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.	Compare lengths and heights. Measure length (1). Measure length (2).	Introduce weight and mass. Measure mass. Compare mass. Introduce capacity. Measure capacity. Compare capacity.
Procedural NC know	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	Represent and use number bonds and related subtraction facts within 20. Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs Add and subtract one-digit and two-digit numbers to 20, including zero Solve one step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7= □ –9.	Count to 50 forwards and backwards, beginning with 0 or 1, or from any number. Count, read and write numbers to 50 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. Count in multiples of twos, fives and tens.	Measurement: Length and Height Measure and begin to record lengths and heights. Compare, describe and solve practical problems for: lengths and heights (for example, long/short, longer/shorter, tall/short, double/half).	Measurement: Weight and Volume Measure and begin to record mass/weight, capacity and volume. 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].
Specific block Vocab	Sort, group, number track, digit, pattern, one more, one less, matched, fewer, greater than (>), less than (<), equal to (=), most, least, fewest, greatest, number line, order, tens (10s), ones (1s), more, smallest, number bond, fact family, compare, 100 square, number square, place value grid.	Group, plus, part-whole model, whole, part, number sentence, altogether, in total, add, count on, missing part, how many are left?, in total, taken away, subtract, subtraction, addition, count backwards, How many more?, How many fewer?, difference.	Sort, group, number track, digit, pattern, one more, one less, matched, fewer, greater than (>), less than (<), equal to (=), most, least, fewest, greatest, number line, order, tens (10s), ones (1s), more, smallest, number bond, fact family, compare, 100 square, number square, place value grid.	long, longer, longest short, shorter, shortest, tall, taller, tallest, length height, compare measure distance ruler centimetre. Measure, estimate.	heavier, heaviest lighter, lightest, full, empty, capacity, balance scales, weight, weigh, balanced, measure, estimate.
NCTEM STEM sentences	**The Big Ideas** The position a digit is placed in a number determines its value. The language used to name numbers does not always expose the place value, for example the word 'twelve' does not make it transparent that the value of this number is ten and two. It is important that children develop secure understanding of the value of each digit. Place value is based on unitising: treating a group of things as one 'unit'. In mathematics, units can be any size, for example units of 1, 2, 5 and 10 are used in money. In place value units of 1, 10 and 100 are used.	**The Big Ideas** Relating numbers to 5 and 10 helps develop knowledge of the number bonds within 20. For example, given 8 + 7, thinking of 7 as 2 + 5 and adding the 2 to 8 to make 10 and then the 5 to total 15. Thinking of part whole relationships is helpful in linking addition and subtraction. For example, where the whole is 6, and 4 and 2 are parts. This means that 4 and 2 together form the whole, which is 6 and 6 subtract 4 leaves the 2 and 6 subtract 2 leaves the 4.	**The Big Ideas** The position a digit is placed in a number determines its value. The language used to name numbers does not always expose the place value, for example the word 'twelve' does not make it transparent that the value of this number is ten and two. It is important that children develop secure understanding of the value of each digit. Place value is based on unitising: treating a group of things as one 'unit'. In mathematics, units can be any size, for example units of 1, 2, 5 and 10 are used in money. In place value units of 1, 10 and 100 are used.	**The Big Ideas** Measurement is about comparison, for example measuring to find out which rope is the longest. Measurement is about equivalence, for example how many cubes are equivalent to the length of the table or the mass of the teddy? Standard units can initially be introduced through using a unit that is greater than the things being compared, for example comparing the capacity of a cup and a carton by filling each and pouring into matching bottles to compare the two. Measuring is a practical activity and the activities below should be conducted in practical contexts, using real materials.	**The Big Ideas** Measurement is about comparison, for example measuring to find out which rope is the longest. Measurement is about equivalence, for example how many cubes are equivalent to the length of the table or the mass of the teddy? Standard units can initially be introduced through using a unit that is greater than the things being compared, for example comparing the capacity of a cup and a carton by filling each and pouring into matching bottles to compare the two. Measuring is a practical activity and the activities below should be conducted in practical contexts, using real materials.

Links	Teaching for Mastery Year 1 I See Reasoning – GM	Teaching for Mastery Year 1 I See Reasoning – GM	Teaching for Mastery Year 1 I See Reasoning – GM	Teaching for Mastery Year 1 I See Reasoning – GM	Teaching for Mastery Year 1 I See Reasoning – GM
White Rose Documents	**Mental Recall:** count to and across 40, forwards and backwards, beginning with 0 or 1, or from any given number count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number **Within 10: Count objects** **Within 10: Counting forwards** **Within 10: count backwards** **Within 10: Counting forwards and backwards** **Within 20: Count and write numbers to 20** **Within 50: Numbers to 50 Counting to 100** count forwards from 80 to 110 count backwards from 105	**Equivalence:** read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs **Within 10: Addition symbol** **Within 10: How many left? (2) (Introducing the subtraction symbol)** **Within 10: Comparing statements (1)** **Within 10: Comparing statements (2)** **Within 20: Compare number sentences** Use the vocabulary add, subtract, minus, equals, is the same value as, total, more than, fewer/less than. Explain that things on both sides of the equals sign have the same value Know that the 'total' can be presented on either side of the equals sign Complete 'empty box' number sentence	**More or less:** Given a number, identify one more and one less **Within 10: Count one more** **Within 10: count one less** **Within 20: Count one more and one less** **Within 50: One more one less** *There are twenty-nine beads in this pot. I am putting one more bead in the pot. How many are in there now? How did you know? How can you check?* *This time there are forty beads in the pot. I take out one bead. How many beads are left in the pot? How did you know? How can you check?* *Start with a different number of beads in the pot. Ask your partner to put another bead in or take one out and then say how many there are in the pot. How will you know if your partner is right?* And use the language of: equal to, more than, less than (fewer), most, least **Within 10: One-to-one correspondence** **Within 10: Comparing objects** **Within 10: Using <,> and =** **Within 10: Comparing numbers** **Within 20: Compare numbers** **Within 20: Compare groups of objects** **Within 50: Compare objects within 50** **Within 50: Compare numbers within 50** **Compare numbers (1)** **Compare numbers (2)** **One more one less** *I'm giving each of you a strip of card with some numbers on [five numbers at random from 0 to 30].* *Point to the number which is worth most. Now point to the number which is worth least.*	**Length and Height:** compare, describe and solve practical problems for lengths and heights (e.g. long/short, longer/shorter, tall/short, double/half) **compare lengths and heights** Use their experience of standard units to make realistic estimates, answering questions such as: Is the table taller or shorter than a metre? Is this doll taller or shorter than one of the class rulers? measure and begin to record lengths and heights **Measure length (1)** **Measure length (2)** Use standard units to measure and compare objects. For example, they place metre sticks end-to-end to find out how much wider the hall is than the classroom.	**Weight:** problems for mass or weight (e.g. heavy/light, heavier than, lighter than **Introduce weight and mass** **Compare mass** Use their experience of standard units to make realistic estimates, answering questions such as: Which of these things do you think will weigh less than a kilogram? There are five cars in one side of the scales. The scales are balanced. What could the doll weigh? measure and begin to record the following mass/weight **Measure mass**
Nrich links	**1** **2** **3** **4**	**1** **2** **3**		**1** **2** **3** **4**	
NCTEM conditional knowledge	**Spot the mistake:** 5,6,8,9 What is wrong with this sequence of numbers? **True or False?** I start at 2 and count in twos. I will say 9 **What comes next?** 10+1 = 11, 11+1= 12, 12+1 = 13 **Do, then explain** Look at the objects (in a collection). Are there more of one type than another? How can you find out?	**Convince me** In my head I have two odd numbers with a difference of 2. What could they be? Convince me **Missing numbers** Fill in the missing numbers (using a range of practical resources to support) 12 + = 19 20 – = 3 **Fact families** Which four number sentences link these numbers? 12, 15, 3 **What else do you know?** If you know; 12 – 9 = 3 what other facts do you know? **Missing symbols** Write the missing symbols (+ - =) in these number sentences: 17 3 20 18 20 2 **Working backwards** Through practical games on number tracks and lines ask questions such as "where have you landed?" and "what numbers would you need to throw to land on other given numbers?" **What do you notice?** 11 – 1 = 10 11 – 10 = 1 Can you make up some other number sentences like this involving 3 different numbers? **Continue the pattern** 10 + 8 = 18 11 + 7 = 18 Can you make up a similar pattern for the number 17? How would this pattern look if it included subtraction? **Missing numbers** 9 + = 10 10 – = 9 What number goes in the missing box? **Making an estimate** Pick (from a selection of number sentences) the ones where the answer is 8 or 9. **Is it true that?** Is it true that 3+4 = 4 + 3?	**Spot the mistake:** 5,6,8,9 What is wrong with this sequence of numbers? **True or False?** I start at 2 and count in twos. I will say 9 **What comes next?** 10+1 = 11, 11+1= 12, 12+1 = 13 **Do, then explain** Look at the objects (in a collection). Are there more of one type than another? How can you find out?	**Top tips** How do you know that this (object) is heavier / longer / taller than this one? Explain how you know **Application** (Can be practical) Which two pieces of string are the same length as this book? **Possibilities** Ella has two silver coins. How much money might she have? **Explain thinking** Ask pupils to reason and make statements about to the order of daily routines in school e.g. daily timetable e.g. we go to PE **after** we go to lunch. Is this true or false? What do we do before break time? etc.	**Top tips** How do you know that this (object) is heavier / longer / taller than this one? Explain how you know **Application** (Can be practical) Which two pieces of string are the same length as this book? **Possibilities** Ella has two silver coins. How much money might she have? **Explain thinking** Ask pupils to reason and make statements about to the order of daily routines in school e.g. daily timetable e.g. we go to PE **after** we go to lunch. Is this true or false? What do we do before break time?

Maths Curriculum Map – Year 1 (Summer)

Number		Geometry		Measure	

	Block 1 Week 1-3	Block 2 Week 4 - 5	Block 3 Week 6	Block 4 Week 7 - 8	Block 5 Week 8	Block 6 Week 10 - 11	Wk 12
	Multiplication (m 2, 5, 10)	**Fractions**	**Position and Direction**	**Place Value (within 100)**	**Money**	**Time**	**Consolidation**
KIRFs	**To know how to make and talk about simple arrays**			**To know how to find ¼ and ½ of a quantity**			
vocab	array, group, equal group, share, times, multiply	The array shows four groups of three apples. It also shows four groups of three apples		half, quarter, equal parts, whole,	Half of ten is five. Is this a quarter, tell me how you know?		
Declarative SK	• double numbers to 10 • find half of even numbers up to 12 and know it is hard to halve odd numbers			• find half of even numbers by sharing • Begin to use concrete and pictorial representations of 'groups of' to find how many sets of a small number make a greater number			
Learning End Points (White Rose)	Count in 10s. •Make equal groups. •Add equal groups. •Make arrays. •Make doubles. •Make equal groups – grouping. •Make equal groups – sharing.	Halving shapes or objects. •Halving a quantity. •Find a quarter of a shape or object. •Find a quarter of a quantity.	Describe turns. •Describe Position (1). •Describe Position (2).	Counting to 100. •Partitioning numbers. •Comparing numbers (1). •Comparing numbers (2). •Ordering numbers. •One more, one less	Recognising coins. •Recognising notes. •Counting in coins.	Before and after. •Dates. •Time to the hour. •Time to the half hour. •Writing time. •Comparing time.	
Procedural NC know	Count in multiples of twos, fives and tens. •Solve one step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.	Recognise, find and name a half as one of two equal parts of an object, shape or quantity. •Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity. •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].	Describe position, direction and movement, including whole, half, quarter and three-quarter turns	Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number. •Count, read and write numbers to 100 in numerals. •Given a number, identify one more and 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, most, least.	Recognise and know the value of different denominations of coins and notes.	Sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening. •Recognise and use language relating to dates, including days of the week, weeks, months and years. •Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. •Compare, describe and solve practical problems for time [for example, quicker, slower, earlier, later]. •Measure and begin to record time (hours, minutes, seconds).	
Specific block Vocab	Equal groups, array, row, column, double, twice, share.	Half, halves, quarter.	Turn, half turn, quarter turn, three-quarter turn, whole turn, position, left right forwards backwards, above, below, top, middle, bottom, up, down, in between.	Sort, group, number track, digit, pattern, one more, one less, matched, fewer, greater than (>), less than (<), equal to (=), most, least, fewest, greatest, number line, order, tens (10s), ones (1s), more, smallest, number bond, fact family, compare, 100 square, number square, place value grid.	Pound, pence, coin, note, pence (p).	Before, after, yesterday, today tomorrow, day, week, slower, faster, month, year. calendar date, minute hand, hour hand, o'clock, half past, second, minute, hour.	
NCTEM STEM sentences	**The Big Ideas** Counting in steps of equal sizes is based on the big idea of 'unitising' ; treating a group of, say, five objects as one unit of five. Working with arrays helps pupils to become aware of the commutative property of multiplication, that 2 × 5 is equivalent to 5 × 2.	**The Big Ideas** Fractions express a relationship between a whole and equal parts of the whole. Ensure children express this relationship when talking about fractions. For example, 'If the circle (where the circle is divided into four equal parts with one part shaded) is the whole, one part is one quarter of the whole circle.' Halving involves partitioning an object, shape or quantity into two equal parts. The two parts need to be equivalent in, for example, area, mass or quantity	**The Big Ideas** It is important for children to be familiar with a range of 2-D and 3-D shapes and not just recognise them in specific orientations, e.g. thinking that this is a triangle but this or this are not . It is preferable to introduce 3-D shapes before 2-D shapes, since 2-D shapes only exist in the real world as faces of 3-D shapes. An emphasis should be placed upon identifying and describing the properties of shapes. It is important that pupils develop the correct mathematical language to do so. The development of precise language to describe position and movement is important.	**The Big Ideas** The position a digit is placed in a number determines its value. The language used to name numbers does not always expose the place value, for example the word 'twelve' does not make it transparent that the value of this number is ten and two. It is important that children develop secure understanding of the value of each digit. Place value is based on unitising: treating a group of things as one 'unit'. In mathematics, units can be any size, for example units of 1, 2, 5 and 10 are used in money. In place value units of 1, 10 and 100 are used.used.	**The Big Ideas** Measurement is about comparison, for example measuring to find out which rope is the longest. Measurement is about equivalence, for example how many cubes are equivalent to the length of the table or the mass of the teddy? Standard units can initially be introduced through using a unit that is greater than the things being compared, for example comparing the capacity of a cup and a carton by filling each and pouring into matching bottles to compare the two. Measuring is a practical activity and the activities below should be conducted in practical contexts, using real materials.	

Links	Teaching for Mastery Y1 I See Reasoning – GM	Teaching for Mastery Y1 I See Reasoning – GM	Teaching for Mastery Y1 I See Reasoning – GM	Teaching for Mastery Y1 I See Reasoning – GM	Teaching for Mastery Y1 I See Reasoning – GM	Teaching for Mastery Y1 I See Reasoning – GM
White Rose Documents	**Mental Calculations:** Counting in fives and tens **Within 50: Count in 2s** **Within 50: count in 5s** **Within 50: Count in 10s** Count groups of 10 each of 2p, 5p and 10p coins solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of a teacher **Derive and Recall:** **Make equal groups** **Add equal groups** **Make arrays** **Make doubles** **Make equal groups – grouping** **Sharing equally** *Explore multiplication and division using apparatus and model how to represent as an array.* **Problem solving:** Ben had 5 football stickers. His friend Tom gave him 5 more, how many does he have altogether? Share 12 sweets between two children. How many do they each have? Show children pictures or groups of objects as below. Ask questions such as "How many biscuits are they altogether? "How many cherries are there altogether?" Observe how children count the objects. Do they count in twos, fives etc or do they count in ones?	**Fractions:** recognise, find and name a half as one of two equal parts of an object, shape or quantity **Find a half (1)** **Find a half (2)** Shade one half of each shape. Can you find different ways to do this? Here is a set of pencils. How many is half of the set? recognise, find and name a quarter as one of four equal parts of an object, shape or quantity **Find a quarter (1)** **Find a quarter (2)** Four children share 12 strawberries into equal parts. How many strawberries will each child get? Colour half of each whole shape:	**Position and Direction:** describe position, direction and movement, including whole, half, quarter and three-quarter turns **Describe turns** **Describe positions (1)** **Describe positions (2)** Look at this map – Desi starts at the bottom. Desi's house is the 2nd on the left. Tick (✔) it. Look at the shelves with the objects. The cups are in the middle row and third from the right. They are below the straws. How could you describe the positions of other things on the shelves? I am thinking of an item. You may ask questions but I can only answer yes or no. You could guess the item in four questions, what questions could they be?	**Place Value:** *Year 2 objective) Begin to recognise the place value of each digit in a two-digit number (tens, ones)* **Within 10: Ordering objects** **Within 10: Ordering numbers** **Within 10: ordinal numbers** **Within 20: Tens and ones** **Within 20: Order groups of objects** **Within 20: Order numbers** **Within 50: Tens and ones** **Within 50: Order numbers within 50** **Partition numbers** **Order numbers** *Look at these numbers.* ***37 12 45 60 72 27*** **Identify, represent, estimate:** *Which of these numbers is the largest?* *Which of these numbers are below 20?* Identify and represent numbers using objects and pictorial representations including the number line **Within 10: representing objects** **Within 10: counting and representing numbers** **Within 10: The number line** **Within 50: represent numbers to 50** *I'm giving each of you a strip of card with some numbers on [five numbers at random from 0 to 30]. Make these numbers using tens and ones apparatus and put them in order.* *Why have you put this number there?*	**Money:** recognise and know the value of different denominations of coins and notes **Recognising coins** **Recognising notes** **Counting in coins** Distinguish coins by sorting them and start to understand their value. They begin to recognise that some coins have a greater value than others, and will buy more: for example, 2p is worth more than 1p; 5p is worth more than 2p; £2 is worth more than £1. They play money games and collect 1p or 2p coins to the value of 10p and begin to count up 'how much this is altogether'. They extend their activities in the classroom shop, paying for items that cost 1p, 3p, 5p, 7p or 9p using only 2p coins, and receiving the appropriate amount of change in 1p coins. They use coins to help them to respond to questions such as: • Michael had £5. He spent £3. How much did he have left? • Rosie had a 10p coin. She spent 3p. How much change did she get? • How much altogether is 1p and 2p and 5p? • Sunita spent 5p and 6p on toffees. What did she pay altogether? • Chews cost 2p each. How much do three chews cost? • An apple costs 12p. Which two coins would pay for it? What combinations of 3 coins would pay for it? Solve one step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems	**Time:** sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening **Before and after** Continue to develop the concept of time in terms of time passing and sequencing events in familiar story or day-to-day routines. They use terms such as morning, afternoon and evening, yesterday and tomorrow. They learn to order the days of the week and learn that weekend days are Saturday and Sunday. They listen to stories and rhymes about time, such as The Very Hungry Caterpillar or The Bad-Tempered Ladybird by Eric Carle, Monster Monday by Susanna Gretz or Hard Boiled Legs by Michael Rosen and Quentin Blake. recognise and use language relating to dates, including days of the week, weeks, months and years **Dates** Order the months of the year and make a 12-page classroom calendar with pictures of each month, writing significant events underneath, such as Diwali, Pancake Day or Midsummer's Day, or the dates of their birthdays.
Nrich links	1 2 3	1 2	1 2 3 4	1 2 3 4		1 2 3
NCTEM conditional knowledge	**Making links** If one teddy has two apples, how many apples will three teddies have? Here are 10 lego people If 2 people fit into the train carriage, how many carriages do we need? Practical If we put two pencils in each pencil pot how many pencils will we need? **Spot the mistake** Use a puppet to count but make some deliberate mistakes. e.g. 2 4 5 6 10 9 8 6 See if the pupils can spot the deliberate mistake and correct the puppet	**What do you notice?** Choose a number of counters. Place them onto 2 plates so that there is the same number on each half. When can you do this and when can't you? What do you notice? **True or false?** Sharing 8 apples between 4 children means each child has 1 apple.	**What's the same, what's different?** Find a rectangle and a triangle in this set of shapes. Tell me one thing that's the same about them. Tell me one thing that is different about them. **Visualising** Put some shapes in a bag. Find me a shape that has more than three edges. **True or false?** All 2-D shapes have at least 4 sides **Other possibilities** Can you find shapes that can go with the set with this label? "Have straight sides"	**Spot the mistake:** 5,6,8,9 What is wrong with this sequence of numbers? **True or False?** I start at 2 and count in twos. I will say 9 **What comes next?** 10+1 = 11, 11+1= 12, 12+1 = 13 **Do, then explain** Look at the objects (in a collection). Are there more of one type than another? How can you find out?	**Top tips** How do you know that this (object) is heavier / longer / taller than this one? Explain how you know **Application** (Can be practical) Which two pieces of string are the same length as this book? **Possibilities** Ella has two silver coins. How much money might she have? **Explain thinking** Ask pupils to reason and make statements about to the order of daily routines in school e.g. daily timetable e.g. we go to PE **after** we go to lunch. Is this true or false? What do we do before break time? etc.	**Top tips** How do you know that this (object) is heavier / longer / taller than this one? Explain how you know **Application** (Can be practical) Which two pieces of string are the same length as this book? **Possibilities** Ella has two silver coins. How much money might she have? **Explain thinking** Ask pupils to reason and make statements about to the order of daily routines in school e.g. daily timetable e.g. we go to PE **after** we go to lunch. Is this true or false? What do we do before break time? etc.

Maths Curriculum Map – Year 2 (Autumn)

Number		Geometry		Measure		Statistics	

	Block 1 Week 1-4	Block 2 Week 5 - 9	Block 3 Week 10 - 12
	Place Value	**Addition and Subtraction**	**Shape**
KIRFs	**To know all the number bonds to 20**	**To know how to count, read and write numerals to 100**	
vocab	To know how to answer these questions in any order, including missing number questions e.g. 19 + ◯ = 20 or 20 – ◯ = 8. What do I **add** to 5 to make 20? What is 20 **take away** 6? What is 3 **less than** 20? **How many more** than 16 is 20?	twenty eight = 28 thirty seven = 37 ninety nine = 99	28, 29, 31 what number is missing? 31, 24, 36, 38 – what needs to be changed in this pattern and why?
Declarative SK	• number bonds [up to 12, and pairs with a total of 20] • add and subtract numbers mentally, including: a two-digit number and ones [which includes bridging the tens]; a two digit number and tens; two two digit numbers; adding three one digit numbers	• add and subtract 10 and small multiples of 10 from any given number • partitioning a number in different ways to support addition and subtraction [taken from Place Value] use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100	
Learning End Points (White Rose)	Count objects to 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.	Fact families –Addition and subtraction bonds to 20. •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.	Recognise 2D and 3D shapes. •Count sides on 2D shapes. •Count vertices on 2D shapes. •Draw 2D shapes. •Lines of symmetry. •Sort 2D shapes. •Make patterns with 2D shapes. •Count faces on 3D shapes. •Count edges on 3D shapes. •Count vertices on 3D shapes. •Sort 3D shapes. •Make patterns with 3D shapes.
Procedural NC know	Read and write numbers to at least 100 in numerals and in words. •Recognise the place value of each digit in a two digit number (tens, ones) Identify, represent and estimate numbers using different representations including the number line. •Compare and order numbers from 0 up to 100; use <, > and = signs. •Use place value and number facts to solve problems. •Count in steps of 2, 3 and 5 from 0, and in tens from any number, forward and backward.	Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100. •Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers; adding three one-digit numbers. •Show that the addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot. •Solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures; applying their increasing knowledge of mental and written methods. •Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	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.
Specific block Vocab	Digit, tens, ones, place value grid, partition, more, fewer, fewest, greatest, smallest, partition.	fact family, number sentence, number bond, 10 more, 10 less, total, tens ones, subtract, difference, bar model, represent, how many are left?, in total, taken away, subtract, count backwards, How many more?, How many fewer?, difference.	Quadrilateral, polygon, pentagon, hexagon, vertex, vertices, line of symmetry, symmetrical, octagon, edge, prism.

NCTEM STEM sentences	**The Big Ideas** The position (place) of a digit in a number determines its value. Hence the term place value	**The Big Ideas** Understanding that addition of two or more numbers can be done in any order is important to support children's fluency. When adding two numbers it can be more efficient to put the larger number first. For example, given 3 + 8 it is easier to calculate 8 + 3. When adding three or more numbers it is helpful to look for pairs of numbers that are easy to add. For example, given 5 + 8 + 2 it is easier to add 8 + 2 first than to begin with 5 + 8. Understanding the importance of the equals sign meaning 'equivalent to' (i.e. that 6 + 4 = 10, 10 = 6 + 4 and 5 + 5 = 6 + 4 are all valid uses of the equals sign) is crucial for later work in algebra. Empty box problems can support the development of this key idea. Correct use of the equals sign should be reinforced at all times. Altering where the equals sign is placed develops fluency and flexibility.		**The Big Ideas** It is not uncommon for pupils to say that this is a square and this is not , or that something like this is a triangle . It is important for pupils to know what the properties are that make up certain shapes, and for them not to just learn the names of typical proto looking shapes. It is helpful to think about non examples of shapes. For example, why this is not a triangle. Recognising pattern and generalising structures and relationships are key elements for laying the foundations for later work in algebra.
Links	**Teaching for Mastery Year 2** **I See Reasoning – GM**	**Teaching for Mastery Year 2** **I See Reasoning – GM**		**Teaching for Mastery Year 2** **I See Reasoning – GM**
White Rose Documents	**Counting:** count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward **Counting in 2s 5s and 10s** **Counting in 3s** Use their knowledge of counting on from or back to zero in steps of 2, 3, 5 and 10 to answer multiplication and division questions such as 7 × 2 and 40 ÷ 5. They understand that one way to work out 40 ÷ 5, for example, is to find out how many fives make 40. They know that this can be done by counting forwards in fives from zero or backwards in fives from 40. Write the missing numbers in each of these patterns. **More or less:** *count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward and find ten more and ten less* e.g. Give me the number 10 less than 93.	**Mental Recall:** recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 **Within 20: Fact families** **Within 20: Compare number sentences** **Related facts** **Bonds to 100 (tens)** **Bonds to 100 (tens and ones)** Extend their knowledge and use of number facts, and use partitioning and number bonds to add and subtract numbers mentally to answer questions such as 60 – □ = 52 or 35 = 20 + □. They make jottings where appropriate to support their thinking. Answer problems such as: Look at this number sentence: □ + □ = 20. What could the two missing numbers be? What else? Can you tell me all the pairs of numbers that make 20? **Equivalence:** show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot Understand that addition can be done in any order and use this to solve an addition by rearranging the numbers to simplify the operation. They need to understand that two numbers can be taken away from each other but that the answers will not be the same.		**Shape:** identify and describe the properties of 2D shapes, including the number of sides and symmetry in a vertical line **Recognise 2D and 3D shapes** **Count sides on 2D shapes** **Count vertices on 2D shapes** **Draw 2D shapes** **Lines of symmetry** compare and sort common 2D shapes and everyday objects **Sort 2D shapes** **Make patterns with 2D shapes** Children can sort two sets of 2D shapes in 2 or more different ways using different criteria each time. For example, they might choose 'dimensions' or 'right angled'
Nrich links	**1** **2**	**1** **2** **3**		**1** **2** **3** **4** **5** **6** **7** **8** **9** **10** **11**
NCTEM conditional knowledge	**Spot the mistake:** 45,40,35,25 What is wrong with this sequence of numbers? **True or False?** I start at 3 and count in threes. I will say 13? **What comes next?** 41+5=46, 46+5=51, 51+5=56 **Do, then explain** 37 13 73 33 3 If you wrote these numbers in order starting with the smallest, which number would be third? Explain how you ordered the numbers. **Do, then explain** Show the value of the digit 2 in these numbers? 32 27 92 Explain how you know. **Make up an example** Create numbers where the units digit is one less than the tens digit. What is the largest/smallest number?	**Convince me** What digits could go in the boxes? Try to find all of the possible answers. How do you know you have got them all? Convince me 7 - 2 = 46 **Fact families** Which four number sentences link these numbers? 100, 67, 33 **What else do you know? If** you know; 87 = 100 – 13 what other facts do you know? **Missing symbols** Write the missing symbols (+ - =) in these number sentences: 80 20 100 100 70 30 87 13 100 **True or false?** Are these number sentences true or false? Give your reasons. 73 + 40 = 113 98 – 18 = 70 46 + 77 = 123 92 – 67 = 35 **Hard and easy questions** Which questions are easy / hard? Explain why you think the hard questions are hard? 23 + 10 = 93 + 10 = 54 + 9 = 54 + 1 = **Other possibilities** + + = 14 What single digit numbers could go in the boxes? How many different ways can you do this? **Continue the pattern** 90 = 100 – 10 80 = 100 – 20 Can you make up a similar pattern starting with the numbers 74, 26 and 100? **Missing numbers** What number goes in the missing box? 91 + = 100 100 - = 89		**What's the same, what's different?** Pick up and look at these 3-D shapes. Do they all have straight edges and flat faces? What is the same and what is different about these shapes? **Visualising** In your head picture a rectangle that is twice as long as it is wide. What could its measurements be? **Always, sometimes, never** Is it always, sometimes or nerver true that when you fold a square in half you get a rectangle? **Other possibilities** Can you find shapes that can go with the set with this label? "Have straight sides and all sides are the same length"

Maths Curriculum Map – Year 2 (Spring)

Number		Geometry		Measure		Statistics	

	Block 1 Week 1-2	Block 2 Week 3 - 7		Block 3 Week 8 - 9	Block 4 Week 10 - 12
	Money	**Multiplication and Division**		**Length and Height**	**Mass and Capacity**
KIRFs	**To know the multiplication and division facts for the 2 times table**		**To know all the multiplication and division facts for the 5 times table**		
vocab	To know how to answer these questions in any order, including missing number questions e.g. 2 × ◯ = 8 or ◯ ÷ 2 = 6.	What is 2 **multiplied by** 7? What is 2 **times** 9? What is 12 **divided by** 2?	To know how to answer these questions in any order, including missing number questions e.g. 5 × ◯ = 40 or ◯ ÷ 5 = 9.	What is 5 **multiplied by** 7? What is 5 **times** 9? What is 60 **divided by** 5?	
Declarative SK	• count in steps of 2 and 5 starting from zero; count in steps of 10 from any number forwards and backwards • begin to count in 3s		• begin to learn the 2x, 5x and 10x tables, seeing these as 'lots of' eg. 5 lots of 2 using fingers, say where a given number is in the 2s, 5s or 10s times tables		
Learning End Points (White Rose)	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. •Find change. •Two-step problems.	**Multiplication:** Recognise equal groups. •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.	**Division:** • Make equal groups –sharing. •Make equal groups –grouping. •Divide by 2.Odd and even numbers. •Divide by 5. •Divide by 10	Measure length (cm). •Measure length (m). •Compare lengths. •Order lengths. •Four operations with lengths.	Compare mass. •Measure mass in grams. •Measure mass in kilograms. •Compare capacity. •Millilitres. •Litres. •Temperature.
Procedural NC know	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.	Recall and use multiplication and division facts for the 2, 5 and 10 times tables, including recognising odd and even numbers. •Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) sign. •Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in contexts. •Show that the 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. •Show that the multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot. Recall and use multiplication and division facts for the 2, 5 and 10 times 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.	Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels. •Compare and order lengths, mass, volume/capacity and record the results using>, < and =.	Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels. •Compare and order lengths, mass, volume/capacity and record the results using >, < and =.
Specific block Vocab	pound (£), pence (p), coin, note, change.	equal groups, multiplication (×), times-table, times, divide (÷), division, share, group, odd, even.		long, longer, longest short, shorter, shortest, tall, taller, tallest, length height, compare measure distance ruler centimetre. Measure, estimate.	Mass, heavier than, lighter than, gram (g), hundreds, kilogram (kg), volume, millilitre (ml), litre (l), temperature, degrees Celsius (°C), thermometer.

NCTEM STEM sentences	**The Big Ideas** We need standard units of measure in order to compare things more accurately and consistently.	**The Big Ideas** It is important that pupils both commit multiplication facts to memory and also develop an understanding of conceptual relationships. This will aid them in using known facts to work out unknown facts and in solving problems. Pupils should look for and recognise patterns within tables and connections between them (e.g. 5× is half of 10×). Pupils should recognise multiplication and division as inverse operations and use this knowledge to solve problems. They should also recognise division as both grouping and sharing. The recognition of pattern in multiplication helps pupils commit facts to memory, for example doubling twice is the same as multiplying by four, or halving a multiple of ten gives you the related multiple of five.	**The Big Ideas** It is important that pupils both commit multiplication facts to memory and also develop an understanding of conceptual relationships. This will aid them in using known facts to work out unknown facts and in solving problems. Pupils should look for and recognise patterns within tables and connections between them (e.g. 5× is half of 10×). Pupils should recognise multiplication and division as inverse operations and use this knowledge to solve problems. They should also recognise division as both grouping and sharing. The recognition of pattern in multiplication helps pupils commit facts to memory, for example doubling twice is the same as multiplying by four, or halving a multiple of ten gives you the related multiple of five.	**The Big Ideas** We need standard units of measure in order to compare things more accurately and consistently.	**The Big Ideas** We need standard units of measure in order to compare things more accurately and consistently.
Links	**Teaching for Mastery Year 2** **I See Reasoning – GM**	**Teaching for Mastery Year 2** **I See Reasoning – GM**	**Teaching for Mastery Year 2** **I See Reasoning – GM**	**Teaching for Mastery Year 2** **I See Reasoning – GM**	**Teaching for Mastery Year 2** **I See Reasoning – GM**
White Rose Documents	**Mental calculations:** recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value; **Count money - pence** **Count money - pounds** **Count money – notes and coins** **Select amounts** **Find the total** **Find the difference** find different combinations of coins that equal the same amounts of money **Make the same amount** Compare money Holly has these coins. Harry has the same amount of money but has six coins. What are they? Is there only one possible answer? solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change **Find change** **Two-step problems** Jess has saved 62p. She spends 15p. How much money does she have left? She pays with a 50p piece. How much change does she get?	**Mental calculations:** calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and = **Add equal groups** **The multiplication symbol** **Multiplication from pictures** **Make equal groups – sharing** **Make equal groups – grouping** Children should be able to: Find missing numbers or symbols in a calculation: 4 x __ = 20 __ ÷ 10 = 3 Anna has 3 boxes of cakes. Each box contains 5 cakes. How many cakes does she have altogether? Show how you worked this out. show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot **Use arrays** Children should be able to: Use their knowledge of triangles of numbers to show related number facts. e.g. If 6 x 2 = 12 then 2 x 6 = 12 and 12 ÷ 6 = 2.	**Equivalence:** recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers **Recognise equal groups** **Make equal groups** **The 2 times table** **The 5 times table** **The 10 times table** **Divide by 2** **Odd and even numbers** **Divide by 5** **Divide by 10** The children should be able to: Recognise a multiple of 2, 5 or 10 and use their knowledge of multiplication facts to find corresponding division facts. They can say which numbers are odd and which are even. e.g. 2 x 5 = 10, show me three more number facts using these numbers. Is 34 an odd number? How do you know?	**Length:** standard units to estimate and measure length/height in any direction (m/cm); to the nearest appropriate unit, using rulers and scales **Measure length (cm)** **Measure length (m)** Suggest sensible units you might use to measure: the height of your table? Choose a piece of equipment to help you measure: how long the classroom is; how long this lesson lasts. How long is this line? Now draw a line 2 cm longer than this one. How long is the pencil? Find an object in the classroom that you think is about 10 cm long. If I programme my floor turtle to go forward three metres is there enough room in the classroom? How could you measure to find out? compare and order length and record the results using >, < , = **Compare lengths** **Order lengths** **Four operations with length**	**Mass, Capacity and Temperature:** choose and use appropriate standard units to estimate and measure temperature (°C) and capacity (litres/ml) to the nearest appropriate unit, using thermometers and measuring vessels **Millilitres** **Litres** **Temperature** Suggest sensible units you might use to measure: how much water is in a cup; the weight of my reading book; how long it takes me to wash my hands, what is the temperature on this thermometer? Choose a piece of equipment to help you measure: how long this lesson lasts; how much water a cup holds. How much water is in this measuring jug? compare and order volume/capacity and record the results using >, < , = **Compare capacity** Megan and Jack are growing beans. Megan's plant is 25 cm tall. Jack's is 38 cm tall. Whose plant is the taller? By how much? Can you compare them using > or < ? **Mass and Weight:** choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); to the nearest appropriate unit, using rulers and scales **Measure mass (g)** **Measure mass (kg)** Suggest sensible units you might use to measure: the weight of my reading book; Choose a piece of equipment to help you measure: the weight of your shoe; About how heavy do you think your pencil case is? compare and order mass, and record the results using >, < , = **Compare mass**
Nrich links	**1** **2** **3**	**1** **2** **3**	**1** **2** **3** **4** **5** **6** **7** **8**	**1**	**1** **2** **3**
NCTEM conditional knowledge	**Top tips** Put these measurements in order starting with the smallest. 75 grammes 85 grammes 100 grammes Explain your thinking **Position the symbols** Place the correct symbol between the measurements > or < 36cm 63cm 130ml 103ml Explain your thinking **Application** (Practical) Draw two lines whose lengths differ by 4cm. **Possibilities** How many different ways can you make 63p using only 2 and 1p coins? **Undoing** The film finishes two hours after it starts. It finishes at 4.30. What time did it start? Draw the clock at the start and the finish of the film. **Explain thinking** The time is 3:15pm. Kate says that in two hours she will be at her football game which starts at 4:15. Is Kate right? Explain why. **Working backwards** Draw hands on the clock faces to show when break started and when it finished 15 minutes later at 10:35. **The answer is ....** 3 hours What is the question? **What do you notice?** What do you notice? 1 hour = 60 minutes ½ hour = 30 minutes ¼ hour = 15 minutes Write down some more time facts like these	**Making links** Write the multiplication number sentences to describe this array What do you notice? Write the division sentences. **Prove It** Which four number sentences link these numbers? 3, 5, 15? Prove it. **Missing numbers** 10 = 5 x What number could be written in the box? **Making links** I have 30p in my pocket in 5p coins. How many coins do I have? **True or false?** When you count up in tens starting at 5 there v always be 5 units. **Use the inverse** Use the inverse to check if the following calculations are correct: 12 ÷ 3 = 4 3 x 5 = 14	**Making links** Write the multiplication number sentences to describe this array What do you notice? Write the division sentences. **Prove It** Which four number sentences link these numbers? 3, 5, 15? Prove it. **Missing numbers** 10 = 5 x What number could be written in the box? **Making links** I have 30p in my pocket in 5p coins. How many coins do I have? **True or false?** When you count up in tens starting at 5 there will always be 5 units. **Use the inverse** Use the inverse to check if the following calculations are correct: 12 ÷ 3 = 4 3 x 5 = 14	**Top tips** Put these measurements in order starting with the smallest. 75 grammes 85 grammes 100 grammes Explain your thinking **Position the symbols** Place the correct symbol between the measurements > or < 36cm 63cm 130ml 103ml Explain your thinking **Application** (Practical) Draw two lines whose lengths differ by 4cm. **Possibilities** How many different ways can you make 63p using only 20p, 10p and 1p coins? **Undoing** The film finishes two hours after it starts. It finishes at 4.30. What time did it start? Draw the clock at the start and the finish of the film. **Explain thinking** The time is 3:15pm. Kate says that in two hours she will be at her football game which starts at 4:15. Is Kate right? Explain why. **Working backwards** Draw hands on the clock faces to show when break started and when it finished 15 minutes later at 10:35. **The answer is ....** 3 hours What is the question? **What do you notice?** What do you notice? 1 hour = 60 minutes ½ hour = 30 minutes ¼ hour = 15 minutes Write down some more time facts like these	**Top tips** Put these measurements in order starting with the smallest. 75 grammes 85 grammes 100 grammes Explain your thinking **Position the symbols** Place the correct symbol between the measurements > or < 36cm 63cm 130ml 103ml Explain your thinking **Application** (Practical) Draw two lines whose lengths differ by 4cm. **Possibilities** How many different ways can you make 63p using only 20p, 10 1p coins? **Undoing** The film finishes two hours after it starts. It finishes at 4.30. What time did it start? Draw the clock at the start and the finish of the film. **Explain thinking** The time is 3:15pm. Kate says that in two hours she will be at her football game which starts at 4:15. Is Kate right? Explain why. **Working backwards** Draw hands on the clock faces to show when break started and when it finished 15 minutes later at 10:35. **The answer is ....** 3 hours What is the question? **What do you notice?** What do you notice? 1 hour = 60 minutes ½ hour = 30 minutes ¼ hour = 15 minutes Write down some more time facts like these

Maths Curriculum Map – Year 2 (Summer)

Number		Geometry		Measure		Statistics	

	Block 1 Week 1 - 2	Block 2 Week 3 - 5	Block 2 Week 6 - 7	Block 3 Week 8 - 9	Block 4 Week 10 - 12
	Statistics	**Fractions**	**Position and Direction**	**Problem Solving and Efficient Methods**	**Time**
KIRFs	**To know the multiplication and division facts for the 10 times table**		**To know all doubles and halves of numbers to 20**		
vocab	To know how to answer these questions in any order, including missing number questions e.g. 10 × ◯ = 40 or ◯ ÷ 10 = 9.	What is 10 **multiplied by** 7? What is 10 **times** 9? What is 60 **divided by 10**?	6 + 6 = 12 7 + 7 = 14 8 + 8 = 16 9 + 9 = 18 10 + 10 = 20 ½ of 12 = 6 ½ of 14 = 7 ½ of 16 = 8 ½ of 18 = 9 ½ of 20 = 10 16 + 16 = 32 17 + 17 = 34 18 + 18 = 36 19 + 19 = 38 20 + 20 = 40		What is **double** 9? What is **half** of 14?
Declarative SK	• double and halve numbers to 20 • begin to double multiples of 5, to 100		• begin to double two-digit numbers less than 50 with ones digits of 1, 2, 3, 4 or 5 show that multiplication of two numbers can be done in any way (commutative) and division of one number can by another cannot relate division to grouping [how many groups of 5 in 15?]		
Learning End Points (White Rose)	Make tally charts. •Draw pictograms (1-1). •Interpret pictograms (1-1). •Draw pictograms (2, 5 and 10). •Interpret pictograms (2, 5 and 10). •Block diagrams.	Make equal parts. •Recognise half. •Find half. •Recognise quarter. •Find a quarter. •Recognise a third. •Find a third. •Unit fractions. •Nonunit fractions. •Equivalence of ½ and $^2/_4$. •Find three quarters. •Count in fractions.	Describing movement. •Describing turns. •Describing movement and turns. •Making patterns with shapes.	ALL	•O'clock and half past. •Quarter past and quarter to. •Telling time to 5 minutes. •Minutes in an hour, hours in a day. •Find durations of time. •Compare durations of time.
Procedural NC know	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.	Recognise, find, name and write fractions 13, 14, 24and 34of a length, shape, set of objects or quantity. •Write simple fractions for example, 12of 6 = 3 and recognise the equivalence of24and 12.	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). •Order and arrange combinations of mathematical objects in patterns and sequences.	ALL	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. •Compare and sequence intervals of time.
Specific block Vocab	Whole, equal, equal parts, ½, fraction, denominator, fraction bar, numerator, ¼, ¾, third 1/3, unit fraction, non-unit fraction, equivalent.	o'clock, half past, quarter past, quarter to, minute hand, hour hand, duration.	Pictogram, key, bar chart, scale, table, row, column, vertical axis, horizontal axis.	Clockwise, anticlockwise, forwards, backwards, left, right, middle, turn, half turn, quarter turn, three-quarter turn.	Whole, equal, equal parts, ½, fraction, denominator, fraction bar, numerator, ¼, ¾, third 1/3, unit fraction, non-unit fraction, equivalent.
NCTEM STEM sentences	**The Big Ideas** Data need to be collected with a question or purpose in mind. Tally charts are used to collect data over t (cars passing the school, birds on the bird t	**The Big Ideas** Fractions involve a relationship between a whole and parts of a whole. Ensure children express this relationship when talking about fractions. For example, 'If the bag of 12 sweets is the whole, then 4 sweets are one third of the whole.' Partitioning or 'fair share' problems when each share is less than one gives rise to fractions. Measuring where the unit is longer than the item being measured gives rise to fractions.	**The Big Ideas** It is not uncommon for pupils to say that this is a square and this is not , or that something like this is a triangle . It is important for pupils to know what the properties are that make up certain shapes, and for them not to just learn the names of typical proto looking shapes. It is helpful to think about non examples of shapes. For example, why this is not a triangle: Recognising pattern and generalising structures and relationships are key elements for laying the foundations for later work in algebra.	**The Big Ideas** solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of a teacher Find half of and double a number or quantity: 16 children went to the park at the weekend. Half that number went swimming. How many children went swimming? I think of a number and halve it. I end up with 9, what was my original number?	**The Big Ideas** We need standard units of measure in order to compare things more accurately and consistently.
Links	Teaching for Mastery Year 2 I See Reasoning – GM	Teaching for Mastery Year 2 I See Reasoning – GM	Teaching for Mastery Year 2 I See Reasoning – GM	Teaching for Mastery Year 2 I See Reasoning – GM	Teaching for Mastery Year 2 I See Reasoning – GM

White Rose Documents

More or less:
interpret and construct simple pictograms, tally charts, block diagrams and simple tables

Make tally charts
Draw pictograms (1-1)
Draw pictograms (2, 5 and 10)
Block diagrams
Class 2 make a graph. 5 children have blue eyes. Show this on a graph. More children have brown eyes than green eyes. How many more?
ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
Interpret pictograms (1-1)
Interpret pictograms (2, 5 and 10)
Look at this pictogram. There are 12 boys in class 5. Show this on the pictogram
How many more girls than boys chose the giraffes?
How many more boys chose lions than elephants?
Which animal was chosen by the greatest number of children?
A shop sold 10 ice lollies on Wednesday
How many lollies were sold on Monday?
How many **more** lollies were sold on Tuesday than on Wednesday

Fractions:
recognise, find, name and write fractions 1/3,1/4 ,2/4 and 3/4 of a length, shape, set of objects or quantity
Equal parts
Recognise a half
Recognise a quarter
Recognise a third
Unit fractions
Non-unit fractions
Count in fractions
Harrison and Sam were talking and Harrison said that if he doubled Sam's age and added 2 he would get 12.
Which of these diagrams have ¼ of the whole shaded?
Explain your reasoning
Jayne says that the shaded part of the whole square does not show a hallf because there are three pieces, not two. Do you agree? Explain your reasoning.
write simple fractions for example, ½ of 6 = 3
Find a half **Find a quarter**
Find a third **Find three quarters**

Position and Direction:
use mathematical vocabulary to describe position, direction and movement including distinguishing between rotation as a turn and in terms of right angles for quarter, half and three- quarter turns (clockwise and anti-clockwise), and movement in a straight line
Describe movement
Describe turns
Describe movement and turns
Recognise whole, half and quarter turns. They describe turns and give and follow instructions to turn. For example, they give instructions to a friend to follow a route around the playground. They make and draw half and quarter turns from the same starting point using, for example, two geo-strips.
Use this grid to help you complete the table –
order and arrange combinations of mathematical objects in patterns
Patterns with shapes
Identify symmetry in a vertical line
Describe the patterns in sequences and predict what comes next in the sequence and continue the pattern.

PV Solving problems:
use place value and number facts to solve problems
Place value charts
Can you find an even number more than 30 and less than 50, how many can you find?
If you put 2 beads onto a tens/ones abacus you can make the numbers 2, 20 and 11.
Do the same with 3 beads. How many different numbers can you make? How many different numbers can you make using 4 beads?
Statistics – Solving problems:
ask and answer questions about totalling and comparing categorical data Some children rolled toy cars down a slope
How far did the blue car roll?
How much further did the green car roll than the red car?
additional questions:
Which car rolled the furthest?
Make up a question about the red car and the yellow car.
Some children were asked to choose their favourite animal in the zoo. This table shows the results

Time:
compare and sequence intervals of time
Durations of time
Compare durations of time
Which is greater? Half an hour 45 minutes 65 minutes 1 hour Can you put these times in order from earliest to latest
- Half past twelve in the afternoon
- Quarter to four in the afternoon
- Nine o'clock in the morning
- Nine o'clock in the evening

Telling the 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
O'clock and half past
Quarter past and quarter to
Telling time to 5 minutes
What time does this clock show?
Draw a clock showing the time five minutes later. Show your school day on clock faces: when do you leave home, have breaks, go back home, etc.?
Which of these clocks shows a time between 5 and 7 o'clock?
Calculating with Time:
Know the number of minutes in an hour and number of hours in a day.
Hours and Days

Nrich links

1 2 3 4 5 6 7 8 9 10 11

1 2 3 4 5 6 7 8 9 10

1 2 3 4 5

1 2 3

NCTEM conditional knowledge

True or false? (Looking at a simple pictogram) "More people travel to work in a car than on a bicycle". Is this true or false? Convince me.
Make up you own 'true/false' statement about the pictogram
What's the same, what's different?
Pupils identify similarities and differences between different representations and explain them to each other
Create a questions Pupils ask (and answer) questions about different statistical representations using key vocabulary relevant to the objectives.

What do you notice?
¼ of 4 = 1
¼ of 8 = 2
¼ of 12 = 3
Continue the pattern What do you notice?
True or false?
Half of 20cm = 5cm ¾ of 12cm = 9cm
Ordering
Put these fractions in the correct order, starting with the smallest. ½ ¼ 1/3
Spot the mistake... and correct it
7, 7 ½ , 8, 9, 10 8 ½, 8, 7, 6 ½,
What comes next?
5 ½, 6 ½ , 7 ½ , …., ….
9 ½, 9, 8 ½, ……, …..
Odd one out. Which is the odd one out in this trio: ½ 2/4 ¼ Why?
What do you notice?
Find ½ of 8, Find 2/4 of 8. What do you notice

What's the same, what's different? Pick up and look at these 3-D shapes. Do they all have straight edges and flat faces?
What is the same and what is different about these shapes?
Visualising
In your head picture a rectangle that is twice as long as it is wide.
What could its measurements be?
Always, sometimes, never
Is it always, sometimes or nerver true that when you fold a square in half you get a rectangle.
Other possibilities
Can you find shapes that can go with the set with this label?
"Have straight sides and all sides are the same length"

Spot the mistake:
45,40,35,25 What is wrong with this sequence of numbers?
True or False? I start at 3 and count in threes. I will say 13?
What comes next?
41+5=46, 46+5=51, 51+5=56
Do, then explain
37 13 73 33 3
If you wrote these numbers in order starting with the smallest, which number would be third?
Explain how you ordered the numbers.
Do, then explain
Show the value of the digit 2 in these numbers? 32 27 92 Explain how you know.
Make up an example
Create numbers where the units digit is one less than the tens digit. What is the largest/smallest number?

Top tips
Put these measurements in order starting with the smallest. 75 grammes 85 grammes 100 grammes
Explain your thinking
Position the symbols
Place the correct symbol between the measurements > or < 36cm 63cm 130ml 103ml Explain your thinking
Application
(Practical) Draw two lines whose lengths differ by 4cm.
Possibilities
How many different ways can you make 63p using only 20p and 1p coins?
Undoing The film finishes two hours after it starts. It finishes at 4.30. What time did it start? Draw the clock at the start and the finish of the film.
Explain thinking
The time is 3:15pm.
Kate says that in two hours she will be at her football game which starts at 4:15. Is Kate right? Explain why.
Working backwards
Draw hands on the clock faces to show when break started and when it finished 15 minutes later at 10:35.
The answer is .... 3 hours
What is the question?
What do you notice?
What do you notice?
1 hour = 60 minutes ½ hour = 30 minutes
¼ hour = 15 minutes
Write down some more time facts like these

Maths Curriculum Map – Year 3 (Autumn)

Number		Geometry		Measure		Statistics	

	Block 1 Week 1-3	Block 2 and 3 Week 4 - 8	Block 4 Week 9 - 10
	Place Value	**Addition and Subtraction**	**Multiplication and Division A**
KIRFs	**To know the number bonds for all numbers to 100 instantly**	**To know how to count in multiples of 50 and 100**	
vocab	To know and be able to answer questions including missing number questions e.g. 49 + ◯ = 100 or 100 – ◯ = 72.	What do I **add** to 65 to make 100? What is 100 **take away** 6? What is 13 **less than** 100? **How many more** than 98 is 100? What is the **difference** between 89 and 100?	To know how to answer these questions in any order, including missing number questions e.g. 4 × ◯ = 16 or ◯ ÷ 4 = 7.	What is 4 **multiplied by** 6? What is 8 **times** 4? What is 24 **divided by** 4?
Declarative SK	• number bonds to 20 • number bonds of multiples of 10 with a total of 100 • partitioning a number of different ways to support addition and subtraction [300 + 8 + 50 = 358 / 536-30=506]		• find 10 or 100 more or less than a given number • add and subtract numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds subtract two-digit number from numbers >100 by counting up when appropriate	
Learning End Points (White Rose)	Hundreds. •Represent numbers to 1,000. •100s, 10s and 1s (1). •100s, 10s and 1s (2). •Number line to 1,000. •Find 1, 10, 100 more or less than a given number. •Compare objects to 1,000. •Compare numbers to 1,000. •Order numbers. •Count in 50s.	Add and subtract multiples of 100. •Add and subtract 3-digit numbers and ones –not crossing 10. •Add 3-digit and 1-digit numbers –crossing 10. •Subtract a 1-digit number from a 3-digit number –crossing 10. •Add and subtract 3-digit numbers and tens –not crossing 100. •Add a 3-digit number and tens –crossing 100. •Add and subtract 100s. •Spot the pattern –making it explicit. •Add and subtract a 2-digit and 3-digit number –not crossing 10 or 100. •Add a 2-digit and 3-digit number –crossing 10 or 100. •Subtract 2-digit number from a 3-digit number cross the 10 or 100. •Add two 3-digit numbers –not crossing 10 or 100. •Add two 3-digit numbers –crossing 10 or 100. •Subtract a 3 –digit number from a 3-digit number –no exchange. •Subtract a 3-digit number from a 3-digit number –exchange. •Exchange answers to calculations. And check.	Multiplication –equal groups. •Multiplying by 3. •Dividing by 3. •The 3 times-table. •Multiplying by 4. •Dividing by 4. •The 4 times-table. •Multiplying by 8. •Dividing by 8. •The 8 times-table.
Procedural NC know	Identify, represent and estimate numbers using different representations. •Find 10 or 100 more or less than a given number. •Recognise the place value of each digit in a three-digit number (hundreds, tens, ones). •Compare and order numbers up to 1000. •Read and write numbers up to 1000 in numerals and in words. •Solve number problems and practical problems involving these ideas. •Count from 0 in multiples of 4, 8, 50 and 100.	Add and subtract numbers mentally, including: a three-digit number and ones; a three-digit number and tens, a three digit number and hundreds. •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.	Count from 0 in multiples of 4, 8, 50 and 100. •Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables. •Write and calculate mathematical statements for multiplication and division using the multiplication tables 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 objectives.

Specific block Vocab	hundreds (100s), tens (10s), ones (1s), digit, place value, more, less, greater than (>), less than (<), equal to, order, compare, partition, estimate, exchange, ascending, descending.	Addition, subtraction, mental method, column method, exchange, estimate, approximate/ly, digit.	Equal, multiply, divide, times-table, sharing, grouping, array, bar model, remainder, repeated addition, multiplication sentence, division statement, division fact, partition.
NCTEM STEM sentences	**The Big Ideas** The value of a digit is determined by its position in a number. Place value is based on unitising, treating a group of things as one 'unit'. This generalises to 3 units + 2 units = 5 units (where the units are the same size).	**The Big Ideas** Relating numbers to 5 and 10 helps develop knowledge of the number bonds within 20. For example, given 8 + 7, thinking of 7 as 2 + 5, and adding the 2 and 8 to make 10, then the 5 to 15. This should then be applied when calculating with larger numbers. Subtraction bonds can be thought of in terms of addition: for example, in answering 15 – 8, thinking what needs to be added to 8 to make 15. Counting on for subtraction is a useful strategy that can also be applied to larger numbers.	**The Big Ideas** It is important for children not just to be able to chant their multiplication tables but also to understand what the facts in them mean, to be able to use these facts to figure out others and to use in problems. It is also important for children to be able to link facts within the tables (e.g. 5× is half of 10×). They understand what multiplication means, see division as both grouping and sharing, and see division as the inverse of multiplication.
Links	**Teaching for Mastery Year 3** **I See Reasoning – GM PP**	**Teaching for Mastery Year 3** **I See Reasoning – GM PP**	**Teaching for Mastery Year 3** **I See Reasoning – GM PP**
White Rose Documents	**Counting:** count from 0 in multiples of 4, 8, 50 and 100; **Hundreds** **Count in 50s** a) Count on from zero in steps of 2, 3, 4, 5, 8, 50, 100; **More or less:** find 10 or 100 more or less than a given number **1, 10, 100 more or less** Give me the number 100 less than 756 **Arabic Numbers:** read and write numbers up to 1000 in numerals and words **Numbers to 1000** Read these numbers 428, 205, 25, 7, 909 compare and order numbers up to 1000 **Comparing objects** **Comparing numbers** **Compare and order** Sort these numbers into ascending order: 95, 163, 8, 740, 25, 0, 400, 303 identify, represent and estimate numbers using different representations **Number line to 1000** Show me 642 on a number line, with Dienes apparatus etc. What number is halfway between 65 and 95? How do you know? **Place Value:** recognise the place value of each digit in a three-digit number (hundreds, tens, ones) **100s, 10s and 1s (1)** **100s, 10s and 1s (2)** For each of these numbers: 428, 205, 130, 25, 7, 909, tell me: How many hundreds? How many tens it has? How many ones?	**Mental Calculations:** add and subtract numbers mentally, including a three-digit number and ones, a three-digit number and tens, three-digit number and hundreds **Add and subtract multiples of 100** **Add and subtract three-digit number and ones – not crossing 10** **Subtract a 1-digit number from a 3-digit number – crossing 10** **Add a 3-digit number and tens – crossing 100** **Subtract tens from a 3-digit number – crossing 100** **Add and subtract 100s** What number is 27 more than 145? What number is 19 more than 145? Explain how you worked out these two calculations. Work out the missing digits: 3☐ + ☐2 = 85 Work out these subtraction calculations: 72 – 5 372 – 68 270 – 3 82 – 15 132 – 28 70 – 66 Did you use the same method for each calculation? If not, why not? Explain your methods to a friend and compare your methods with theirs. What number is 199 more than 428? What is the difference between 1999 and 4003? **Written calculations:** digits, using formal written methods of columnar addition and subtraction **Add 3-digit and 1-digit – crossing 10** **Add and subtract 3-digit numbers and tens – not crossing 100** **Spot the pattern – making it explicit** **Add and subtract a 2-digit and 3-digit number – not crossing 10 or 100** **Add a 2-digit and 3-digit number – crossing 10 or 100** **Subtract a 2-digit number from a 3-digit number – cross the 10 or 100** **Add two 3-digit numbers – not crossing 10 or 100** **Add two 3-digit numbers – crossing 10 or 100** **Subtract a 3-digit number from a 3-digit number – no exchange** **Subtract a 3-digit number from a 3-digit number – exchange** Would you use a mental, written or calculator method to solve each of these? Explain your choice. 23.05 + ☐ = 176.25 What is the total cost if I buy food costing £3.86 and £8.57? These are the start and finish times of a film. START 14:05 FINISH 16:25 How long was the film? A packet of crisps costs 32p. Josh buys two packets. How much change does he get from £1?	**Mental calculations:** 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 **Multiplication – equal groups** **Comparing statements** One orange costs nineteen pence. How much will three oranges cost? Mark drives 19 miles to work every day and 19 miles back. He does this on Mondays, Tuesdays, Wednesdays, Thursdays and Fridays. How many miles does he travel to work and back in one week? **Written Calculations – multiplication:** 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 **Multiply 2-digits by 1-digit (1)** **Multiply 2-digits by 1-digit (2)** **Divide 2-digits by 1-digit (1)** **Divide 2-digits by 1-digit (2)** **Divide 2-digits by 1-digit (3)** **Derive and recall:** recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables **Multiply by 3** **Divide by 3** **The 3 times table** **Multiply by 4** **Divide by 4** **The 4 times table** **Multiply by 8** **Divide by 8** **The 8 times table** **Related facts** Multiply seven by three; what is four multiplied by nine? Etc. Circle three numbers that add to make a multiple of 4 11 12 13 14 15 16 17 18 19 Leila puts 4 seeds in each of her pots. She uses 6 pots and has 1 seed left over. How many seeds did she start with? At Christmas, there are 49 chocolates in a tin and Tim shares them between himself and 7 other members of the family. How many chocolates will each person
Nrich links	**1** **2** **3**		**1** **2**
NCTEM conditional knowledge	**Spot the mistake:** 50,100,115,200 What is wrong with this sequence of numbers? **True or False?** 38 is a multiple of 8 **What comes next?** 936-10= 926, 916- 10= 906 926 -10 = 916, **Do, then explain** 835 535 538 388 508 If you wrote these numbers in order starting with the smallest, which number would be third? Explain how you ordered the numbers. **Do, then explain** Show the 3 value of the digit 3 in these numbers? 341 503 937 Explain how you know. **Make up an example** Create numbers where the digit sum is three. Eg 120, 300, 210 What is the largest/smallest number? **Possible answers** A number rounded to the nearest ten is 540. What is the smallest possible number it could be? **What do you notice?** Round 296 to the nearest 10. Round it to the nearest 100. What do you notice? Can you suggest other numbers like this?	**True or false?** Are these number sentences true or false? 597 + 7 = 614 804 – 70 = 744 768 + 140 = 908 Give your reasons. **Hard and easy questions** Which questions are easy / hard? 323 + 10 = 393 + 10 = 454 - 100 = 954 - 120 = Explain why you think the hard questions are hard? **Convince me** The total is 201 Each missing digit is either a 9 or a 1. Write in the missing digits. Is there only one way of doing this or lots of ways? Convince me **Possibilities** I bought a book which cost between £9 and £10 and I paid with a ten pound note. My change was between 50p and £1 and was all in silver coins. What price could I have paid?	**Use a fact** 20 x 3 = 60. Use this fact to work out 21 x 3 = 22 x 3 = 23 x 3 = 24 x 3 = **Prove It -** What goes in the missing box? **How close can you get?** ☐ ☐ × ☐ Using the digits 2, 3 and 4 in the calculation above how close can you get to 100? What is the largest product? What is the smallest product? **Missing numbers** 24 = x Which pairs of numbers could be written in the boxes? **Making links** Cards come in packs of 4. How many packs do I need to buy to get 32 cards? **Use the inverse** Use the inverse to check if the following calculations are correct 23 x 4 = 82 117 ÷ 9 = 14 **Size of an answer** Will the answer to the following calculations be greater or less than 80 23 x 3= 42 x 3 = 32 x 3 = 36 x 2= **True or false?** All the numbers in the two times table are even. There are no numbers in the three times table that are also in the two times table.

Maths Curriculum Map – Year 3 (Spring)

Number		Geometry		Measure		Statistics	

	Block 1 Week 1-3	Block 2 Week 4 - 6	Block 6 Week 7 - 9	Block 4 Week 10 - 12
	Fractions A	**Length and Perimeter**	**Multiplication and Division B**	**Mass and Capacity**
KIRFs	**To know how to find ten more or less than a given number**		**To know the multiplication and division facts for the 3 times table**	
vocab	more, less, hundreds, tens, column, same, digit,	What is ten more than 87? What is ten less than 115? What is one hundred more than 267? What is one hundred less than 349?	To know how to answer these questions in any order, including missing number questions e.g. 3 × ◯ = 12 or ◯ ÷ 3 = 9	What is 8 **multiplied by** 3? What is 3 **times** 8? What is 15 **divided by** 3?
Declarative SK	• add and subtract 9 and 11 by adjustment • add pairs of 'friendly' three-digit numbers [320+450] Use addition and subtraction facts [9 -7 =2] to derive related facts [89-7=82] • start with greatest first when adding		• count for 0 in steps of 4, 8, 50 and 100 [*pupils should now know and use multiples of 2, 3, 4, 5, 8, 10, 50 and 100*] • through doubling, they connect the 2, 4 and 8 multiplication tables multiply and divide whole numbers by 10 and 100	
Learning End Points (White Rose)	Unit and non-unit fractions. •Making the whole. •Tenths. •Count in tenths. •Tenths as decimals. •Fractions of a number line. •Fractions of a set of objects (1). •Fractions of a set of objects (2). •Fractions of a set of objects (3).	Measure length. •Equivalent lengths –m & cm. •Equivalent lengths –mm & cm. •Compare lengths. •Add lengths. •Subtraction lengths. •Measure perimeter. •Calculate perimeter.	Comparing statements. •Related calculations. •Multiply 2-digits by 1-digit (1). •Multiply 2-digits by 1-digit (2). •Divide 2-digits by 1-digit (1). •Divide 2-digits by 1-digit (2). •Divide 2-digits by 1-digit (3). •Scaling. •How many ways?	Measure mass (1). •Measure mass (2). •Compare mass. •Add and subtract mass. •Measure capacity (1). •Measure capacity (2). •Compare capacity. •Add and subtract capacity.
Procedural NC know	Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10. •Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators. •Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. •Solve problems that involve all of the above.	Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml). •Measure the perimeter of simple 2D shapes.	Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables. •Write and calculate mathematical statements for multiplication and division using the multiplication tables they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. •Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objectives.	Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).
Specific block Vocab		Length, height, width, perimeter, distance, centimetre (cm), millimetre (mm), metre (m), unit of Measurement, measure, equivalent, convert, greater than (>), less than (<), ruler, metre stick, Interval, scale.	multiply (×), divide (÷), multiplication fact, division fact, lots of, groups of, times-table, array, partition, bar model, part-whole model, remainder, commutative.	Mass, heavier than, lighter than, gram (g), hundreds, kilogram (kg), volume, millilitre (ml), litre (l).

NCTEM STEM sentences	**The Big Ideas** Fractions are equal parts of a whole. Equal parts of shapes do not need to be congruent but need to be equal in area. Decimal fractions are linked to other fractions. The number line is a useful representation that helps children to think about fractions as numbers.	**The Big Ideas** Developing benchmarks to support estimation skills is important as pupils become confident in their use of standard measures. The height of a door frame, for example, is approximately 2 metres, and a bag of sugar weighs approximately 1 kilogram.	**The Big Ideas** It is important for children not just to be able to chant their multiplication tables but also to understand what the facts in them mean, to be able to use these facts to figure out others and to use in problems. It is also important for children to be able to link facts within the tables (e.g. 5× is half of 10×). They understand what multiplication means, see division as both grouping and sharing, and see division as the inverse of multiplication.	**The Big Ideas** Developing benchmarks to support estimation skills is important as pupils become confident in their use of standard measures. The height of a door frame, for example, is approximately 2 metres, and a bag of sugar weighs approximately 1 kilogram.
Links	**Teaching for Mastery Y3** **I See Reasoning – GM PP**	**Teaching for Mastery Y3** **I See Reasoning – GM PP**	**Teaching for Mastery Y3** **I See Reasoning – GM PP**	**Teaching for Mastery Y3** **I See Reasoning – GM PP**
White Rose Documents	**Recognise fractions:** unit fractions and non-unit fractions with small denominators **Unit and non-unit fractions** **Tenths** Unit Fractions. Unit means one. Here are some examples of unit fractions. Non-unit fractions. Unit means one, so non-unit is any number apart from one. Here are some examples of non-unit fractions. Many (or, rather, more than one of the) parts, of an equally divided whole, is a non-unit fraction. What fraction of this shape is shaded? How do you know? **Fractions as numbers:** recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators **Count in tenths** **Fractions on a number line** Position fractions on a number line; eg. mark fractions such as ½, 3 ½ and 2 3/10 on a number line marked from zero to 5. A fraction of each shape is shaded. Match each fraction to the correct place on the number line. One has been done for you. **Fractions of amounts:** recognise, find and write fractions of a discrete set of objects: **Fractions of an amount (1)** **Fractions of an amount (2)** **Fractions of an amount (3)** Is there another way that you can describe the fraction? *One fifth of 60kg* *Two fifths of 50 litres*	**Calculating measures:** measure, compare, add and subtract: lengths (m/cm/mm); **Measure length** **Draw accurately** Length: children should be able to find something that they think is just shorter/longer than a metre/ centimetre/ millimetre. They should be able to check whether they are right. What is the difference in length between the pen and the pencil? measure, compare, add and subtract: volume/capacity (l/m) **Converting Units:** measure, compare, add and subtract: lengths (m/cm/mm); **Equivalent lengths (m and cm)** **Equivalent lengths (mm and cm)** **Compare lengths** **Add lengths** **Subtract lengths**	**Checking:** estimate the answer to a calculation and use inverse operations to check answers Matthew sys if he has 75 sweets shared by 5 friends, they will each have 17 sweets. Write down a multiplication questions that you could do to check this? **Multiples and Factors:** *(Year 4 objective) Begin to recognise and use factor pairs and commutativity in mental calculations within the multiplication facts that they have learnt* **Solving Problems:** 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 **Scaling** **How many ways** Miss West needs 28 paper cups. She has to buy them in packs of 6 How many packs does she have to buy? Tom is laying tiles. He has 84 tiles; how many complete rows and columns could he make? Fill in the missing digits in these calculations	**Mass and Capacity:** **Measure capacity (1)** **Measure capacity (2)** Here is a tea urn and a teapot. The bottles show how much water each can hold. How much more does the tea urn hold? Capacity: Find a container that they think would hold one litre and check to find out if they were correct. measure, compare, add and subtract: mass (kg/g); **Measure mass (1)** **Measure mass (2)** Mass: Say which object in the classroom is heavier than 100 g/kilogram/half-kilograms and know how to check if they are correct. What is the weight of the flour shown by this scale? Say what each division on this scale is worth and explain how they worked this out. **Converting Units:** measure, compare, add and subtract: volume/capacity (l/m) **Compare capacity** **Add and subtract capacity** measure, compare, add and subtract: mass (kg/g); **Compare mass** **Add and subtract mass**
Nrich links	**1** **2** **3** **4** **5** **6** **7**	**1** **2** **3**	**1** **2**	**1** **2** **3**
NCTEM conditional knowledge	**True or false?** (Looking at a bar chart) "Twice as many people like strawberry than lime". Is this true or false? **Convince me.** Make up your own 'true/false' statement about the bar chart. **What's the same, what's different?** Pupils identify similarities and differences between different representations and explain them to each other **Create a question** Pupils ask (and answer) questions about different statistical representations using key vocabulary relevant to the objectives.	**Top Tips** Put these measurements in order starting with the largest. Explain your thinking Half a litre; Quarter of a litre; 300 ml **Position the symbols** Place the correct symbol between the measurements > or < 306cm Half a metre 930 ml 1 litre **Write more statements** If there are 630ml of water in a jug. How much water do you need to add to end up with a litre of water? What if there was 450 ml to start with? **Position the symbols** Place the correct symbols between the measurements > or < Explain your thinking £23.60 2326p 2623p	**Use a fact** 20 x 3 = 60. Use this fact to work out 21 x 3 = 22 x 3 = 23 x 3 = 24 x 3 = **Prove It** What goes in the missing box? **How close can you get?** □ □ × □ Using the digits 2, 3 and 4 in the calculation above how close can you get to 100? What is the largest product? What is the smallest product? **Missing numbers** 24 = x Which pairs of numbers could be written in the boxes? **Making links** Cards come in packs of 4. How many packs do I need to buy to get 32 cards? **Use the inverse** Use the inverse to check if the following calculations are correct 23 x 4 = 82 117 ÷ 9 = 14 **Size of an answer** Will the answer to the following calculations be greater or less than 80 23 x 3= 32 x 3 = 42 x 3 = 36 x 2= **True or false?** All the numbers in the two times table are even. There are no numbers in the three times table that are also in the two times table.	**Top Tips** Put these measurements in order starting with the largest. Explain your thinking Half a litre; Quarter of a litre; 300 ml **Position the symbols** Place the correct symbol between the measurements > or < 306cm Half a metre 930 ml 1 litre **Write more statements** If there are 630ml of water in a jug. How much water do you need to add to end up with a litre of water? What if there was 450 ml to start with? **Position the symbols** Place the correct symbols between the measurements > or < Explain your thinking £23.60 2326p 2623p

Maths Curriculum Map – Year 3 (Summer)

Number		Geometry		Measure		Statistics	

	Block 1 Week 1-2	Block 2 Week 3 - 4	Block 3 Week 5 - 7	Block 4 Week 8 - 9	Block 5 Week 10 - 11	Wk 12
	Fractions B	**Money**	**Time**	**Properties of Shape**	**Statistics**	**Consolidation**
KIRFs	**To know the multiplication and division facts for the 4 times table**		**To know the multiplication and division facts for the 8 times table**			
vocab	To know how to answer these questions in any order, including missing number questions e.g. 4 × ◯ = 16 or ◯ ÷ 4 = 5	What is 4 **multiplied by** 6? What is 4 **times** 8? What is 12 **divided by** 4?	To know how to answer these questions in any order, including missing number questions e.g. 8 × ◯ = 16 or ◯ ÷ 8 = 7	What is 8 **multiplied by** 6? What is 8 **times** 8? What is 24 **divided by** 8?		
Declarative SK	• use place value and number facts in mental multiplication a division [20x5 is 15x10 / 84÷4 is half of 42] • partition teen numbers to multiply by a single digit [3x14 is 3x10 add 3x4] • show that multiplication of two numbers can be done in any way (commutative) and division of one number can by another cannot			• double numbers up to 50 • halve even numbers to 100, halve odd numbers to 20 • use multiplication and division facts [3 x 2 = 6 so 6 ÷ 3 = 2] to derive related facts [30 x 2 = 60 so 60 ÷3 = 20]		
Learning End Points (White Rose)	Equivalent fractions (1), •Equivalent fractions (2). •Equivalent fractions (3). •Compare fractions. •Order fractions. •Add fractions. •Subtract fractions.	Pounds and pence. •Converting pounds and pence. •Adding money. •Subtracting money. •Giving change.	Months and years. •Hours in a day. •Telling the time to 5 minutes. •Telling the time to the minute. •AM and PM. •24 hour clock. •Finding the duration. •Comparing the duration. •Start and end times. •Measuring time in seconds.	Turns and angles. •Right angles in shapes. •Compare angles. •Draw accurately. •Horizontal and vertical. •Parallel and perpendicular. •Recognise and describe 2D shapes. •Recognise and describe 3D shapes. •Make 3D shapes.	Pictograms. •Bar charts. •Tables.	
Procedural NC know	Recognise and show, using diagrams, equivalent fractions with small denominators. •Compare and order unit fractions, and fractions with the same denominators. •Add and subtract fractions with the same denominator within one whole [for example, $^5/_7 + 1/_7 = {}^6/_7$]. •Solve problems that involve all of the above.	Add and subtract amounts of money to give change, using both £ and p in practical contexts.	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. •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].	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. •Draw 2-D shapes and make 3-D shapes using modelling materials. •Recognise 3-D shapes in different orientations and describe them.	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.	
Specific block Vocab		Convert, total, difference, pound (£), pence (p), coin, note, change.	Month, year, midnight, midday, am, pm, duration, estimate, consecutive, hour, minute, second, past, to, start, end, digital clock, analogue clock.	right angle, acute, obtuse, parallel, perpendicular, vertical, horizontal, triangle, quadrilateral, kite, trapezium, rhombus, parallelogram, cuboid, triangular prism, square-based, pyramid, cone, cylinder, sphere, edge, face, vertices.	Pictogram, key, bar chart, scale, table, row, column, vertical axis, horizontal axis.	

NCTEM STEM sentences	**The Big Ideas** Fractions are equal parts of a whole. Equal parts of shapes do not need to be congruent but need to be equal in area. Decimal fractions are linked to other fractions. The number line is a useful representation helps children to think about fractions as numbers.	**The Big Ideas** Developing benchmarks to support estimation skills is important as pupils become confident in their use of standard measures. The height of a door frame, for example, is approximately 2 metres, and a bag of sugar weighs approximately 1 kilogram.	**The Big Ideas** Developing benchmarks to support estimation skills is important as pupils become confident in their use of standard measures. The height of a door frame, for example, is approximately 2 metres, and a bag of sugar weighs approximately 1 kilogram.	**The Big Ideas** During this year there is an increasing range of shapes that pupils are familiar with. The introduction of symmetrical and non-symmetrical polygons and the requirement that pupils should be able to draw them will give rise to discussions about lengths of sides and sizes of angles. Pupils need to appreciate these features as properties of shapes as well as the number of sides and vertices. Pupils recognise that angles are about the amount of turn – the lengths of the lines used to represent angles do not affect the size of the angle. Pupils recognise that relationships are at the heart of properties of shapes, not particular measurements. For example, the opposite sides of any rectangle will always be equal, not that rectangles have a pair of long sides and a pair of short sides.	**The Big Ideas** Data needs to be collected with a question or purpose in mind. Tally charts are used to collect data over time (cars passing the school, birds on the bird table). They can also be used to keep track of counting.
Links	**Teaching for Mastery Y3** **I See Reasoning – GM PP**	**Teaching for Mastery Y3** **I See Reasoning – GM PP**	**Teaching for Mastery Y3** **I See Reasoning – GM PP**	**Teaching for Mastery Y3** **I See Reasoning – GM PP**	**Teaching for Mastery Y3** **I See Reasoning – GM PP**
White Rose Documents	**Counting:** Count up and down in tenths **Equivalent Fractions:** recognise and show, using diagrams, equivalent fractions with small denominators **Equivalent fractions (1)** **Equivalent fractions (2)** **Equivalent fractions (3)** Children should be able to: Identify pairs of fractions that total 1. Circle two fractions that have the same value **Compare and order fractions:** compare and order unit fractions, and fractions with the same denominator **Compare fractions** **Order fractions** Children should be able to answer questions like: Would you rather have 1/3 of 30 sweets or 1/5 of 40 sweets? Why? **Fractions and Decimals:** recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 **Tenths as decimals** Children should be able to: Use decimal notation for tenths Divide single digits or whole numbers by 10 Explain how finding 1/10 is the same as dividing by 10 Here is part of a number line. Write in the numbers missing from the two empty boxes. **Adding and Subtracting Fractions:** add/subtract fractions with the same denominator within one whole (e.g. 5/7 + 1/7 = 6/7) **Making the whole** **Add fractions** **Subtract fractions** This could also be done by using drawings and in the array form:	**Money:** add and subtract amounts of money to give change, using both £ and p in practical contexts **Pounds and pence** **Converting pounds and pence** **Adding money** **Subtracting money** **Giving change** Jake wants to buy a comic that costs £1. He saves 25p one week and 40p the next. How much more money does he need to buy the comic? Add these prices: £6.73, £9.10 and £7.00 to find the total. Find out how much more do you need to add to get £23?	**Telling the time:** tell and write the time from an analogue clock, including Roman numerals from I to XII, and 12-hour and 24-hour clocks **Telling the time (1)** **Telling the time (2)** **24 hour clock** Read times like this in analogue and digital formats, including those with Roman numerals. What time does each clock show? Ben's clock says 7:50 when he gets up. Show this time on a clock face. estimate and read time with increasing accuracy to the nearest minute, **Measure time in seconds** use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight **am and pm** **Calculating the Time:** Kevin leaves home at quarter past 8 and arrives in school at 20 to 9. How long is his journey? How did you work this out? How long is it between the times shown on these two clocks? How did you work it out? Calculating the Time: know the number of seconds in a minute and the number of days in each month, year and leap year **Months and years** **Hours in a day** How many minutes is 140 seconds? What is the date of the day after 30th November? How many days are they in January? record and compare time in terms of seconds, minutes, hours and o'clock; compare durations of events, for example to calculate the time taken by particular events or tasks **Finding the duration** **Compare the duration** **Start and end times** Estimate how long your favourite TV programme lasts. Use a television guide to work out how close your estimation was. It takes 35 minutes to walk from home to school. I need to be there by 8.55 am. What time do I need to leave home? How much does it cost to hire a rowing boat for three hours? Sasha pays £3.00 to hire a motor boat. She goes out at 3:20 pm. By what time must she return? Explain how you solved this problem. Could you have done it in a different way? Sally and Maria both went to the gym on Saturday. Sally was there from 2 pm until 3.30pm. Maria was there from 12.30 pm until 3.15 pm. Who spent the longer time at the gym? How much longer was she there than her friend?	**Properties of Shape:** draw 2D shapes; **Recognise and describe 2D shapes** make 3D shapes using modelling materials; **Construct 3D shapes** recognise 3D shapes in different orientations and describe them **Recognise and describe 3D shapes** use appropriate mathematical vocabulary to describe the features of 2D and 3D shapes including semicircles, hemispheres and prisms sort and classify collections of 2D shapes in different ways using a range of properties including: 'all sides are of equal length,' 'has at least one right angle' or 'has at least one line of symmetry' and record their classifications on Venn and Carroll diagrams, including diagrams involving more than one criterion How many triangles can you draw on a 3x3 pin board? How many quadrilaterals can you draw on a 3x3 pin board? In each case, how do you decide if the shapes are the same or different? Could you find different right angled triangles, or is there only one? Can you name the different quadrilaterals? Identify horizontal and vertical lines and pairs of perpendicular and parallel lines **Horizontal and vertical** **Parallel and Perpendicular**	**Statistics:** interpret and present data using bar charts, pictograms and tables **Pictograms** **Bar charts** **Tables** Process, present and interpret data to pose and answer questions. They use all representations such as Venn and Carroll diagrams, bar charts, pictograms. They collect data quickly onto a class tally chart. Children recognise that a tally involves grouping in fives and that this helps them to count the frequencies quickly and accurately. They produce a simple pictogram and/or bar chart, where a symbol represents 2 units. Children sort and classify objects, numbers or shapes according to two criteria, and display this work on Venn and Carroll diagrams Can you put the all numbers in the correct places? Class 3 collected litter in the park – How many of each item did they collect? How many more bags did they get than cans?
Nrich links	1 2 3 4 5 6 7	1 2 3 4 5 6 7 8 9 10	1	1 2 3 4 5 6 7 8 9
NCTEM conditional knowledge	**Spot the mistake** six tenths, seven tenths, eight tenths, nine tenths, eleven tenths ... and correct it. **Odd one out.** Which is the odd one out in each of these trios? ½ 3/6 5/8 3/9 2/6 4/9 Why? **What do you notice?** 1/10 + 9/10 = 1 2/10 + 8/10 = 1 3/10 + 7/10 = 1 **Continue the pattern** Can you make up a similar pattern for eighths? The answer is 5/10, what is the question? (involving fractions / operations)	**Top Tips** Put these measurements in order starting with the largest. Explain your thinking Half a litre; Quarter of a litre; 300 ml **Position the symbols** Place the correct symbol between the measurements > or < 306cm Half a metre 930 ml 1 litre **Write more statements** If there are 630ml of water in a jug. How much water do you need to add to end up with a litre of water? What if there was 450 ml to start with? **Position the symbols** Place the correct symbols between the measurements > or < Explain your thinking £23.60 2326p 2623p	**Testing conditions** A square has sides of a whole number of centimetres. Which of the following measurements could represent its perimeter?8cm 18cm 24cm 25cm Undoing A programme lasting 45 minutes finishes at 5.20. At what time did it start? Draw the clock at the start and finish time. Explain thinking Salha says that 100 minutes is the same as 1 hour. Is Salha right? Explain why. Working backwards Tom's bus journey takes half an hour. He arrives at his destination at 9:25. At what time did his bus leave? 9:05 8:55 8:45 The answer is .... 25 minutes What is the question? What do you notice? What do you notice? 1 minute = 60 seconds 2 minutes = 120 seconds Continue the pattern Write down some more time facts like these	**What's the same, what's different?** **Visualising** I am thinking of a 3-dimensional shape which has faces that are triangles and squares. What could my shape be? **Other possibilities** One face of a 3D shape is a square. What shape could it be? Are there any other possibilities? **Always, sometimes, never** Is it always, sometimes or never that all sides of a hexagon are the same length? **Other possibilities** Can you find shapes that can go with the set with this label? "Have straight sides that are different lengths." **Convince me** Which capital letters have perpendicular and / or parallel lines? Convince me.	**What comes next?** 6/10, 7/10, 8/10, ..., ... 12/10, 11/10, ..., ..., ... **True or false?** 2/10 of 20cm = 2cm 4/10 of 40cm = 4cm 3/5 of 20cm = 12cm **Give an example** of a fraction that is less than a half. Now another example that no one else will think of. Explain how you know the fraction is less than a half(draw an image) **Put in Order** Ben put these fractions in order starting with the smallest. Are they in the correct order? One fifth, one seventh, one sixth **What do you notice?** 1/10 of 10 = 1 2/10 of 10 = 2 3/10 of 10 = 3 Continue the pattern. What do you notice? What about 1/10 of 20? Use this to work out 2/10 of 20, etc **What do you notice?** Find 2/5 of 10. Find 4/10 of 10. What do you notice? Can you write any other similar statements?

Maths Curriculum Map – Year 4 (Autumn)

Number		Geometry		Measure		Statistics	

	Block 1 Week 1-4	Block 2 Week 5-7	Block 3 Week 8	Block 4 Week 9-11	Week 12
	Place Value	**Addition and Subtraction**	**Area**	**Multiplication and Division**	**Consolidation**
KIRFs	**To know the multiplication and division facts for the 6 times table**		**To know the multiplication and division facts for the 9 and 11 times tables**		
vocab	To know and be able to answer these questions in any order, including missing number questions e.g. 6 × ◯ = 72 or ◯ ÷ 6 = 7.	What is 8 **multiplied by** 6? What is 6 **times** 8? What is 24 **divided by** 6?	They should be able to answer these questions in any order, including missing number questions e.g. 9 × ◯ = 54 or ◯ ÷ 9 = 11.	What is 8 **multiplied by** 6? What is 6 **times** 8? What is 24 **divided by** 6?	
Declarative SK	• know by heart/quickly derive number bonds to 100 and to £1 [add to the next hundred and pound] • find 1000 more or less than a given number • count backwards through zero to include negative numbers		• round any number to the nearest 10, 100 or 1000 • add and subtract any two-digit numbers by partitioning or counting on • add and subtract multiples of 10, 100 and 1000 to two-digit and three-digit numbers • add and subtract £1, 10p and 1p to amounts of money		
Learning End Points (White Rose)	Roman numerals to 100. •Round to the nearest 10. •Round to the nearest 100. •Count in 1,000s. •1,000s, 100s, 10s and 1s. •Partitioning. •Number line to 10,000. •1,000 more or less. •Compare numbers. •Order numbers. •Round to the nearest 1,000. •Count in 25s. •Negative numbers.	Add and subtract 1s, 10s, 100s and 1000s. •Add two 4-digit numbers –no exchange. •Add two 4-digit numbers –one exchange. •Add two 4-digit numbers –more than one exchange. •Subtract two 4-digit numbers –no exchange. •Subtract two 4-digit numbers –one exchange. •Subtract two 4-digit numbers –more than one exchange. •Efficient subtraction. •Estimate answers. •Checking strategies	What is area? •Counting squares •Making shapes. •Comparing area.	Multiply by 10. •Multiply by 100. •Divide by 10. •Divide by 100. •Multiply by 1 and 0. •Divide by 1. •Multiply and divide by 6. •6 times-table and division facts. •Multiply and divide by 9. •9 times-table and division facts. •Multiply and divide by 7. •7 times-table and division facts.	
Procedural NC know	Count in multiples of 6, 7, 9. 25 and 1000. •Find 1000 more or less than a given number. •Recognise the place value of each digit in a four digit number (thousands, hundreds, tens and ones). •Order and compare numbers beyond 1000. •Identify, represent and estimate numbers using different representations. •Round any number to the nearest 10, 100 or 1000. •Solve number and practical problems that involve all of the above and with increasingly large positive numbers. •Count backwards through zero to include negative numbers.	Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate. •Estimate and use inverse operations to check answers to a calculation. •Solve addition and subtraction two step problems in contexts, deciding which operations and methods to use and why.	Find the area of rectilinear shapes by counting squares.	Recall and use multiplication and division facts for multiplicationtables up to 12 ×12. •Count in multiples of 6, 7, 9. 25 and 1000. •Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers. •Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.	
Specific block Vocab	Tens, hundreds, thousands, rounding, order, more than (>), less than (<), partition, numeral, nearest, distance, ascending, descending, rounding, negative, step, multiple, greater than (>), less than (<).	Addition, total, more than (>), subtraction, less than (<), column method, estimate, how much, strategy, efficient, accurate, exact, fact.	multiply (×), divide (÷), multiplication fact, division fact, lots of, groups of, times-table, array, partition array, bar model, part-whole model, remainder, factor pair, factor, commutative.	Length, width, area, distance, rectangle, square, rectilinear shape, centimetre (cm), metre (m), kilometre (km), equivalent to.	

NCTEM STEM sentences	**The Big Ideas** Imagining the position of numbers on a horizontal number line helps us to order them: the number to the right on a number line is the larger number. So 5 is greater than 4, as 5 is to the right of 4. But –4 is greater than –5 as –4 is to the right of –5. Rounding numbers in context may mean rounding up or down. Buying packets of ten cakes, we might round up to the nearest ten to make sure everyone gets a cake. Estimating the number of chairs in a room for a large number of people we might round down to estimate the number of chairs to make sure there are enough. We can think of place value in additive terms: 456 is 400 + 50 + 6, or in multiplicative terms: one hundred is ten times as large as ten.	The Big Ideas It helps to round numbers before carrying out a calculation to get a sense of the size of the answer. For example, 4786 – 2135 is close to 5000 – 2000, so the answer will be around 3000. Looking at the numbers in a calculation and their relationship to each other can help make calculating easier. For example, 3012 – 2996. Noticing that the numbers are close to each other might mean this is more easily calculated by thinking about subtraction as difference.	**The Big Ideas** The smaller the unit, the greater the number of unit s needed to measure (that is, there is an inverse relationship between size of unit and measure).	The Big Ideas It is important for children not just to be able to chant their multiplication tables but to understand what the facts in them mean, to be able to use these facts to figure out others and to use them in problems. It is also important for children to be able to link facts within the tables (e.g. 5× is half of 10×). They understand what multiplication means and see division as both grouping and sharing, and to see division as the inverse of multiplication. The distributive law can be used to partition numbers in different ways to create equivalent calculations. For example, 4 × 27 = 4 × (25 + 2) = (4 × 25) + (4 × 2) = 108. Looking for equivalent calculations can make calculating easier. For example, 98 × 5 is equivalent to 98 × 10 ÷ 2 or to (100 × 5) – (2 × 5). The array model can help show equivalences.
Links	**Teaching for Mastery Year 4** **I See Reasoning – GM PP**	**Teaching for Mastery Year 4** **I See Reasoning – GM PP**	**Teaching for Mastery Year 4** **I See Reasoning – GM PP**	**Teaching for Mastery Year 4** **I See Reasoning – GM**
White Rose Documents	**Counting:** count from 0 in multiples of 4, 8, 50 and 100; Hundreds Count in 50s a) Count on from zero in steps of 2, 3, 4, 5, 8, 50, 100; **More or less:** find 10 or 100 more or less than a given number 1, 10, 100 more or less Give me the number 100 less than 756 **Arabic Numbers:** read and write numbers up to 1000 in numerals and words Numbers to 1000 Read these numbers 428, 205, 25, 7, 909 compare and order numbers up to 1000 Comparing objects Comparing numbers Compare and order Sort these numbers into ascending order: 95, 163, 8, 740, 25, 0, 400, 303 identify, represent and estimate numbers using different representations Number line to 1000 Show me 642 on a number line, with Dienes apparatus etc. What number is halfway between 65 and 95? How do you know? **Place Value:** recognise the place value of each digit in a three-digit number (hundreds, tens, ones) 100s, 10s and 1s (1) 100s, 10s and 1s (2) For each of these numbers: 428, 205, 130, 25, 7, 909, tell me: How many hundreds? How many tens it has? How many ones?	**Mental calculation** (Year 3 objective) add and subtract numbers mentally, including a three-digit number and ones, a three-digit number and tens, three-digit number and hundreds Year 4 1s, 10s, 100s, 1000s What is 27 more than 185? What is 19 less than 208? 3 ● 5 + ● 48 = 473 What's the difference between 2996 and 5008? **Written calculations** add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate Addition – no exchange Addition – one exchange Addition – more than one exchange Subtraction – no exchange Subtraction – one exchange Subtraction – more than one exchange Subtraction – efficient subtraction solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why Children should be able to carry out practical tasks such as to run the class market stall. I have read 134 of the 512 pages of my book. How many more pages must I read to reach the middle? There are 8 shelves of books. 6 of the shelves hold 25 books each. 2 of the shelves have 35 books each. How many books altogether are on the shelves? I think of a number, subtract 17, and divide by 6. The answer is 20. What was my number? You start to read a book on Thursday. On Friday you read 10 more pages than on Thursday. You reach page 60. How many pages did you read on Thursday? A shop sells sunglasses What is the difference between the cheapest and most expensive? Ryan buys sunglasses at £4.69 and a sun hat He pays with £10 note. How much change will he get?	**Find the area of rectilinear shapes by counting squares** **What is area? Counting squares** **Making shapes** **Comparing area** Draw irregular shapes on centimetre square grids, and compare their areas and perimeters Here are some shapes. What is the perimeter of shape A? What is the area of shape B? Which shape has the smallest area?	**Use place value, known and derived facts to multiply and divide mentally, including multiplying by 0 and 1; dividing by 1; multiplying together three numbers** **Multiply by 10 Multiply by 100 Divide by 10** **Divide by 100 Multiply by 1 and 0 Divide by 1 Efficient multiplication** Practise mental methods and extend this to three-digit numbers to derive facts for example 200 × 3 = 600 into 600 ÷ 3 = 200. Plants are sold in trays of 20. Hannah buys 7 tr many plants does she buy? Eggs are sold in trays of 30 eggs. The trays can be sta layers. How many eggs are in this picture? **recall multiplication and division facts for multiplication tables up to 12 × 12** **Multiply and divide by 6** **6 times table and division facts** **Multiply and divide by 9** **9 times table and division facts** **Multiply and divide by 7** **7 times table and division facts** Children should be able to continue to practise recalling and using multiplication and related division facts to aid fluency. One orange costs eleven pence, how much will three oranges cost?
Nrich links	1 2 3 4	1 2 3 4 5	1 2	1 2
NCTEM conditional knowledge	**Spot the mistake:** 50,100,115,200 What is wrong with this sequence of numbers? **True or False?** 38 is a multiple of 8 **What comes next?** 936-10= 926, 926 -10 = 916, 916- 10= 906 **Do, then explain** 835 535 538 388 508 If you wrote these numbers in order starting with the smallest, which number would be third? Explain how you ordered the numbers. **Do, then explain** Show the 3 value of the digit 3 in these numbers? 341 503 937 Explain how you know. **Make up an example** Create numbers where the digit sum is three. Eg 120, 300, 210 What is the largest/smallest number? **Possible answers** A number rounded to the nearest ten is 540. What is the smallest possible number it could be? **What do you notice?** Round 296 to the nearest 10. Round it to the nearest 100. What do you notice? Can you suggest other numbers like this?	**Making an estimate True or false?** Are these number sentences true or false? 6.7 + 0.4 = 6.11 8.1 – 0.9 = 7.2 Give your reasons. **Hard and easy questions** Which questions are easy / hard? 13323 - 70 = 12893 + 300 = 19354 - 500 = 19954 + 100 = Explain why you think the hard questions are hard? **Convince me** - 666 = 8 5 What is the largest possible number that will go in the rectangular box? What is the smallest? Convince me **Possibilities** Adult tickets cost £8 and Children's tickets cost £4. How many adult and children's tickets could I buy for £100 exactly? Can you find more than one way of doing this? Which of these number sentences have the answer that is between 550 and 600. 1174 – 611 3330 – 2779 9326 - 8777 **Always, sometimes, never** Is it always sometimes or never true that the difference between two odd numbers is odd?	Testing conditions If the width of a rectangle is 3 metres less than the length and the perimeter is between 20 and 30 metres, what could the dimensions of the rectangle be? Convince me. Always, sometimes, never? If you double the area of a rectangle, you double the perimeter.	**Use a fact** 63÷9=7 Use this fact to work out 126÷9= **Prove It** What goes in the missing box? □ x 4 = 512 **Prove it.** How close can you get? □ □ □ x 7 Using the digits 3, 4 and 6 in the calculation above how close can you get to 4500? What is the largest product? What is the smallest product? Size of an answer Will the answer to the following calculations be greater or less than 300 152 x 2= 78 x 3 = 87 x 3 = 4 x 74 =

Maths Curriculum Map – Year 4 (Spring)

Number		Geometry		Measure		Statistics	

	Block 1 Week 1-3	Block 2 Week 4 - 5	Block 6 Week 6 - 9	Block 4 Week 10-12
	Multiplication and Division	**Length and Perimeter**	**Fractions**	**Decimals**
KIRFs	**To know the multiplication and division facts for the 7 times table**		**To know the multiplication and division facts for the 12 times table**	
vocab	They should be able to answer these questions in any order, including missing number questions e.g. 7 × ◯ = 28 or ◯ ÷ 6 = 7.	What is 7 **multiplied by** 6? What is 7 **times** 8? What is 84 **divided by** 7?	They should be able to answer these questions in any order, including missing number questions e.g. 12 × ◯ = 24 or ◯ ÷ 12 = 7.	What is 7 **multiplied by** 12? What is 12 **times** 8? What is 48 **divided by** 12?
Declarative SK	• derive quickly doubles of multiples of 10 up to 500 eg. 360+360 • use place value and number facts to add one, two, three and four-digit numbers where a mental calculation is appropriate • subtract by counting up • count form 0 in steps of 6, 7, 9 25 and 1000 *[children should know by heart all the multiplication facts up to 12x12]*		• use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; multiplying by 10 and 100; dividing by 1; multiplying together three numbers • multiply multiples of 10, 100, 1000 by single digit numbers [300 x 6 or 4000 x 8] • use distributive law to multiply larger numbers [36 x 5 could be 30 x5 and 6 x 5 adjustment by spotting 'nearly' numbers eg 6 x 19 is nearly 6 x 20	
Learning End Points (White Rose)	11 and 12 times-table. •Multiply 3 numbers. •Factor pairs. •Efficient multiplication. •Written methods. •Multiply 2-digits by 1 –digit. •Multiply 3-digits by 1-digit. •Divide 2-digits by 1-digit (1). •Divide 2-digits by 1-digit (2). •Correspondence problems.	Kilometres. •Perimeter on a grid. •Perimeter of a rectangle. •Perimeter of rectilinear shapes.	What is a fraction? •Equivalent fractions (1) •Equivalent fractions (2). •Fractions greater than 1. •Count in fractions. •Add 2 or more fractions. •Subtract 2 fractions. •Subtract from whole amounts. •Calculate fractions of a quantity. •Problem solving –calculate quantities.	Recognise tenths and hundredths. •Tenths as decimals. •Tenths on a place value grid. •Tenths on a number line. •Divide 1 digit by 10. •Divide 2 digits by 10. •Hundredths. •Hundredths as decimals. •Hundredths on a place value grid. •Divide 1 or 2 digits by 100.
Procedural NC know	Recall and use multiplication and division facts for multiplication tables up to 12 ×12. •Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers. •Recognise and use factor pairs and commutativity in mental calculations. •Multiply two digit and three digit numbers by a one digit number using formal written layout. •Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	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].	Recognise and show, using diagrams, families of common equivalent fractions. •Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. •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.	Recognise and write decimal equivalents of any number of tenths or hundredths. •Find the effect of dividing a one or two digit number by 10 or 100, identifying the value of the digits in the answer as ones, tenths and hundredths.
Specific block Vocab	Equal, multiply, divide, times-table, sharing, grouping, array, bar model, remainder, repeated addition, multiplication sentence, division statement, division fact, partition.	Length, width, perimeter, distance, rectangle, square, rectilinear shape, centimetre (cm), metre (m), kilometre (km), equivalent to.	Tenths, hundredths, equivalent, simplify, numerator, denominator, fraction, mixed number, improper fraction, simplest fraction, fraction of an amount, decimal point, equivalent decimal, 0·1 and 0·01, decimal place.	

NCTEM STEM sentences	**The Big Ideas** It is important for children not just to be able to chant their multiplication tables but to understand what the facts in them mean, to be able to use these facts to figure out others and to use them in problems. It is also important for children to be able to link facts within the tables (e.g. 5× is half of 10×). They understand what multiplication means and see division as both grouping and sharing, and to see division as the inverse of multiplication. The distributive law can be used to partition numbers in different ways to create equivalent calculations. For example, 4 × 27 = 4 × (25 + 2) = (4 × 25) + (4 × 2) = 108. Looking for equivalent calculations can make calculating easier. For example, 98 × 5 is equivalent to 98 × 10 ÷ 2 or to (100 × 5) − (2 × 5). The array model can help show equivalences.	The Big Ideas The smaller the unit, the greater the number of unit s needed to measure (that is, there is an inverse relationship between size of unit and measure).	**The Big Ideas** Fractions arise from solving problems, where the answer lies between two whole numbers. Fractions express a relationship between a whole and equal parts of a whole. Children should recognise this and speak in full sentences when answering a question involving fractions. For example, in response to the question What fraction of the chocolate bar is shaded? the pupil might say Two sevenths of the whole chocolate bar is shaded. Equivalency in relation to fractions is important. Fractions that look very different in their symbolic notation can mean the same thing.	**The Big Ideas** Fractions arise from solving problems, where the answer lies between two whole numbers. Fractions express a relationship between a whole and equal parts of a whole. Children should recognise this and speak in full sentences when answering a question involving fractions. For example, in response to the question What fraction of the chocolate bar is shaded? the pupil might say Two sevenths of the whole chocolate bar is shaded. Equivalency in relation to fractions is important. Fractions that look very different in their symbolic notation can mean the same thing.
Links	**Teaching for Mastery Year 4 I See Reasoning – GM PP**	**Teaching for Mastery Year 4 I See Reasoning – GM PP**	**Teaching for Mastery Year 4 I See Reasoning – GM PP**	**Teaching for Mastery Year 4 I See Reasoning – GM PP**
White Rose Documents	**Efficient multiplication** multiply two-digit and three-digit numbers by a one-digit number using formal written layout **Written methods Multiply 2 digits by 1 digit Multiply 3 digits by 1 digit** **Divide 2 digits by 1 digit (1)** **Divide 2 digits by 1 digit (2)** **Divide 3 digits by 1 digit** recall multiplication and division facts for multiplication tables up to 12 × 12 **11 and 12 times table and division facts** recognise and use factor pairs and commutativity in mental calculations **Factor pairs** Children should be able to write statements about the equality of expressions (e.g. 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 solve mental and written calculations e.g. 2 x 6 x 5 = 10 x 6. e.g. Understand and use when appropriate the principles (but not the names) of the commutative, associative and distributive laws as they apply to multiplication: Example of commutative law 8 × 15 = 15 × 8 Example of associative law 6 × 15 = 6 × (5 × 3) =(6×5)×3=30×3=90 Example of distributive law 18 × 5 = (10 + 8) × 5 =(10×5)+(8×5)=50+40=90	**estimate, compare and calculate different measures, Use calculation strategies to solve one- and two-step word problems, including those involving money and measures.** Use rounding to estimate the solution, choose an appropriate method of calculation (mental, mental with jottings, written method) and then check to see whether their answer seems sensible. Throw a beanbag three times and find the difference between their longest and shortest throws. After measuring their height, children work out how much taller they would have to grow to be the same height as their teacher. **Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres** **Perimeter on a grid Perimeter of a rectangle Perimeter of rectilinear shapes** Children can measure the edges of a rectangle and then combine these measurements. They realise that by doing this they are calculating its perimeter. Given the perimeter of a rectangle they investigate what the lengths of its sides could be. Children can work out the perimeter of irregular shapes drawn on a centimetre square grid. **Convert between different units of measure [for example, kilometre to metre; hour to minute** **Kilometres** Children learn the relationships between familiar units of measurement. They learn that kilo means one thousand to help them remember that there are 1000 grams in 1 kilogram and 1000 metres in 1 kilometre. A bag of flour weighs 2 kg. How many grams is this? Children can suggest suitable units to measure length, weight and capacity; for example, they suggest a metric unit to measure the length of their book, the weight of a baby, the capacity of a mug. They suggest things that you would measure in kilometres, metres, litres, kilograms, etc. Children can record lengths using decimal notation, for example recording 5 m 62 cm as 5.62 m, or 1 m 60 cm as 1.6 m. They identify the whole-number, tenths and hundredths parts of numbers presented in decimal notation and relate the whole number, tenths and hundredths parts to metres and centimetres in length.	(Year 3 objective) unit fractions and non-unit fractions with small denominators Year 4 **What is a fraction?** (Year 3 objective) recognise and use fractions as numbers: unit fractions and non- unit fractions with small denominators **Fractions greater than 1** **Count in fractions** **Fractions of a quantity** **Calculate quantities** count up and down in hundredths Continue the count 1.91, 1.92, 1.93, 1.94 recognise and show, using diagrams, families of common equivalent fractions **Equivalent fractions (1)** **Equivalent fractions (2)** Recognise that five tenths (5/10) or one half of this diagram is shaded. Recognise that two eighths (2/8) or one quarter (¼) of the set of buttons is ringed Recognise that one whole is equivalent to two halves, three thirds, four quarters... For example, build a fraction 'wall' using a computer program and then estimate parts. Recognise patterns in equivalent fractions - ½ = 2/4 = 3/6 = 4/8 = 5/10 and similar patterns for - ⅓, ¼, ⅕, ⅙, 1/10 add and subtract fractions with the same denominator **Add 2 or more fractions** **Subtract 2 fractions** **Subtract from whole amounts** 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 What is one-fifth of twenty-five?	compare numbers with the same number of decimal places up to two decimal places **Tenths on a number line** **Compare decimals** **Order decimals** 0.3, 0.1, 0.9, 0.5, 1.2, 1.9 Which is lighter: 3.5kg or 5.5kg? 3.72kg or 3.27kg? Which is less: £4.50 or £4.05? How many pence is £5.98, £5.60, £7.06, £4.00? Put in order, largest/smallest first: 6.2, 5.7, 4.5, 7.6, 5.2, 99, 1.99, 1.2, 2.1 Write the total of ten £1 coins and seven 1p coins (£10.07) Write centimetres in metres. For example, write: 125 cm in metres (1.25 metres) recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten recognise and write decimal equivalents of any number of tenths or hundredths **Tenths and hundredths** **Tenths as decimals** **Tenths on a place value grid** **Hundredths** **Hundredths as decimals** **Hundredths on a place value grid** What does the digit 6 in 3.64 represent? The 4? What is the 4 worth in the number 7.45? The 5? Suggest a decimal fraction between 4.1 and 4.2 Know how many 10 pence pieces equal £1, how many 1 pence pieces equal £1, how many centimetres make a metre. Recognise 0.07 is equivalent to 7/100 and 6.35 is equivalent to 6 35/100 etc Which of these decimals is equal to 19/100? 1.9 10.19 0.19 19.1
Nrich links	1 2 3 4 5 6 7 8 9		1 2 3	
NCTEM conditional knowledge	**Missing numbers** 72 = x Which pairs of numbers could be written in the boxes? Making links Eggs are bought in boxes of 12. I need 140 eggs; how many boxes will I need to buy? **Making links** 4 × 6 = 24 How does this fact help you to solve these calculations? 40 x 6 = 20 x 6 = 24 x 6 =	**Solve problems such as:** A family sets off to drive 524 miles. After 267 miles, how much further do they still have to go? A can of soup holds 400 ml. How much do 5 cans hold? Each serving is 200 ml. How many cans would I need for servings for 15 people? A string is 6.5 metres long. I cut off 70 cm pieces to tie up some balloons. How many pieces can I cut from the string? A jug holds 2 litres. A glass holds 250 ml. How many glasses will the jug fill?	What comes next? 83/100, 82/100, 81/100, ..., ..., ... 31/100, 41/100, 51/100, ..., ..., What do you notice? 1/10 of 100 = 10 1/100 of 100 = 1 2/10 of 100 = 20 2/100 of 100 = 2 How can you use this to work out 6/10 of 200? 6/100 of 200? True or false? 1/20 of a metre= 20cm 4/100 of 2 metres = 40cm Give an example of a fraction that is more than a half but less than a whole. Now another example that no one else will think of. Explain how you know the fraction is more than a half but less than a whole. (draw an image) What do you notice? Find 4/6 of 24 Find 2/3 of 24 What do you notice? Can you write any other similar statements? What do you notice? 5/5 − 1/5 = 4/5 Can you make up a similar pattern for addition? 4/5 − 1/5 = 3/5 Continue the pattern The answer is 3/5, what is the question? What do you notice? 11/100 + 89/100 = 1 12/100 + 88/100 = 1 13/100 + 87/100 = 1 Continue the pattern for the next five number sentences	Spot the mistake sixty tenths, seventy tenths, eighty tenths, ninety tenths, twenty tenths ... and correct it. Missing symbol Put the correct symbol < or > in each box 3.03 3.33 0.37 0.32 What needs to be added to 3.23 to give 3.53? What needs to be added to 3.16 to give 3.2?

Maths Curriculum Map – Year 4 (Summer)

Number		Geometry		Measure		Statistics	

	Week 1-2 Block 1	Week 3-4 Block 2	Week 5 - 6 Block 3	Wk 7	Week 8-9 Block 4	Week 10 Block 5	Week 11 - 12 Block 6
	Decimals	**Money**	**Time**	**C**	**Properties of shapes**	**Statistics**	**Position and direction**
KIRFs	**To know the multiplication and division facts for all times tables up to 12 × 12**				**To know how to identify equivalent fractions**		
vocab	They should be able to answer these questions in any order, including missing number questions e.g. 7 × ◯ = 28 or ◯ ÷ 6 = 7.		What is 12 **multiplied by** 6? What is 7 **times** 8? What is 84 **divided by** 7?		Children should be able to convert between decimals and fractions for ½, ¼, ¾ and any number of tenths and hundredths.		How many **tenths** is 0.8? How many **hundredths** is 0.12? Write 0.75 as a **fraction**? Write ¼ as a **decimal**?
Declarative SK	• recognise factors up to 12 of two-digit numbers. • use understanding of place value and number facts in mental multiplication [36 x 5 is half of 36 x 10 and 50 x 60 = 3000] • partition 2-digit numbers to multiply by a single-digit number mentally [4 x 24 as 4 x 20 and 4 x 4]				• multiply near multiples using rounding [33 x 19 as 33 x 20 – 33] • find doubles to double 100 and beyond using partitioning • begin to double amounts of money [£35.60 doubled = £71.20] show that multiplication of two numbers can be done in any way (commutative) and division of one number can by another cannot		
Learning End Points (White Rose)	Make a whole. •Write decimals. •Compare decimals. •Order decimals. •Round decimals. •Halves and quarters.	Pounds and pence. •Ordering amounts of money. •Using rounding to estimate money. •Four operations.	Hours, minutes and seconds. •Years, months, weeks and days. •Analogue to digital – 12 hour. •Analogue to digital – 24 hour.	**Consolidation**	Identify angles. •Compare and order angles. •Triangles. •Quadrilaterals. •Lines of symmetry. •Complete a symmetric figure.	Interpret charts. •Comparison, sum and difference. •Introducing line graphs. •Line graphs.	Describe position. •Draw on a grid. •Move on a grid. •Describe a movement on a grid.
Procedural NC know	Compare numbers with the same number of decimal places up to two decimal places. •Round decimals with one decimal place to the nearest whole number. •Recognise and write decimal equivalents to ¼, ½ and ¾. •Find the effect of dividing a one or two digit number by 10 or 100, identifying the value of the digits in the answer as ones, tenths and hundredths	Estimate, compare and calculate different measures, including money in pounds and pence. •Solve simple measure and money problems involving fractions and decimals to two decimal places.	Read, write and convert time between analogue and digital 12-and 24-hour clocks. •Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.		Identify acute and obtuse angles and compare and order angles up to two right angles by size. •Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. •Identify lines of symmetry in 2-D shapes presented in different orientations. •Complete a simple symmetric figure with respect to a specific line of symmetry.	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.	Describe positions on a 2-D grid as coordinates in the first quadrant. •Plot specified points and draw sides to complete a given polygon. •Describe movements between positions as translations of a given unit to the left/ right and up/ down.
Specific block Vocab	Tenths, hundredths, equivalent, simplify, numerator, denominator, fraction, mixed number, improper fraction, simplest fraction, fraction of an amount, decimal point, equivalent decimal, 0·1 and 0·01, decimal place.	Convert, total, difference, pound (£), pence (p), coin, note, change.	Convert, compare, unit of time, second, minute, hour, day, week, month, year, 12-hour, 24-hour, analogue, digital, am/pm.		Rectangle, square, rectilinear shape, unit, triangle, quadrilateral, reflection, regular, irregular, interior angle, angle, acute, obtuse, right angle.	Data, line graph, pictogram, bar chart, table, altogether, more than (>), greatest, smallest, continuous data, compare.	Reflection, position, horizontal, vertical, up, down, left, right, coordinates, square, rectangle, plot, vertex, vertices, point grid.

NCTEM STEM sentences	**The Big Ideas** Fractions arise from solving problems, where the answer lies between two whole numbers. Fractions express a relationship between a whole and equal parts of a whole. Children should recognise this and speak in full sentences when answering a question involving fractions. For example, in response to the question What fraction of the chocolate bar is shaded? the pupil might say Two sevenths of the whole chocolate bar is shaded. Equivalency in relation to fractions is important. Fractions that look very different in their symbolic notation can mean the same thing.	**The Big Ideas** The smaller the unit, the greater the number of units needed to measure (that is, there is an inverse relationship between size of unit and measure).	**The Big Ideas** The smaller the unit, the greater the number of units needed to measure (that is, there is an inverse relationship between size of unit and measure).	**The Big Ideas** In mathematics the focus is on numerical data. These can be discrete or continuous. Discrete data are counted and have fixed values, for example the number of children who chose red as their favourite colour (this has to be a whole number and cannot be anything in between). Continuous data are measured, for example at what time did each child finish the race? (Theoretically this could be any time: 67·3 seconds, 67·33 seconds or 67·333 seconds, depending on the degree of accuracy that is applied.) Continuous data are best presented with a line graph where every point on the line has a potential value.	**The Big Ideas** During this year, pupils increase the range of 2-D and 3-D shapes that they are familiar with. They know the correct names for these shapes, but, more importantly, they are able to say why certain shapes are what they are by referring to their properties, including lengths of sides, size of angles and number of lines of symmetry. The naming of shapes sometimes focuses on angle properties (e.g. a rectangle is right-angled), and sometimes on properties of sides (e.g. an equilateral triangle is an equal sided triangle). Shapes can belong to more than one classification. For example, a square is a rectangle, a parallelogram, a rhombus and a quadrilateral.
Links	**Teaching for Mastery Year 4** **I See Reasoning – GM PP**	**Teaching for Mastery Year 4** **I See Reasoning – GM PP**	**Teaching for Mastery Year 4** **I See Reasoning – GM PP**	**Teaching for Mastery Year 4** **I See Reasoning – GM PP**	**Teaching for Mastery Year 4** **I See Reasoning – GM PP**
White Rose Documents	**Make a whole** **Write decimals** Write each of these as a decimal fraction: 27/100 3/100 2 33/100 Write the decimal fraction equivalent to: two tenths and five hundredths; twenty-nine hundredths; fifteen and nine hundredths. recognise and write decimal equivalents to ¼;½;¾ 0.5 is equivalent to ½, 0.25 is equivalent to ¼, 0.75 is equivalent to ¾, 0.1 is equivalent to 1/10 Particularly in the context of money and measurement. Write the decimal fraction equivalent to: two tenths and five hundredths; twenty-nine hundredths; fifteen and nine hundredths	estimate, compare and calculate different measures, including money in pounds and pence **Pounds and Pence** **Order money** **Estimating money** **Four operations with money** Solve problems such as: •Dad bought three tins of paint at £5.68 each. How much change does he get from £20 •Tins of dog food cost 42p. They are put into packs of 10. How much does one pack of dog food cost? 10 packs? •I spent £4.63, £3.72 and 86p. How much did I spend altogether? •Dean saves the same amount of money each month. He saves £149.40 in a year. How much money does he save each month?	read, write and convert time between analogue and digital 12- and 24-hour clocks **Analogue to digital – 12 hour** **Analogue to digital – 24 hour** Here are some flights from Manchester. The flight to Dublin takes fifty minutes. At what time will the Dublin flight arrive? The Paris flight lands at 2.45pm, how long does the flight take? solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days **Hours, minutes and seconds** **Years, months, weeks and years** Raiza got into the pool at 2:26 pm. She swam until 3 o'clock. How long did she swim? Dev leaves school at 15.25. He arrives home at ten past four pm. How many minutes did it take Dev to walk home? These are the prices in a shoe shop. How much more do the boots cost than the trainers? Rosie buys a pair of trainers and a pair of sandals. How much change does she get from £50? Harry spent one quarter of his savings on a book. What did the book cost if he saved: £8...£10...£2.40...? A box of four balls costs £2.96. How much does each ball cost? Dean and Alex buy 3 boxes of balls between them. Dean pays £4.50. How much must Alex pay? A full bucket holds 5½ litres. A full jug holds ½ a litre. How many jugs full of water will fill the bucket? Max jumped 2.25 metres on his second try at the long jump. This was 75 centimetres longer than on his first try. How far in metres did he jump on his first try?	compare and classify geometric shapes, including quadrilaterals and triangles based on their properties and sizes Triangles Quadrilaterals Pupils should be able to complete this sentence: All equilateral triangles have ... identify acute and obtuse angles; compare and order angles up to two right angles by size Identify angles Compare and order angles identify lines of symmetry in 2-D shapes presented in different orientations Lines of symmetry complete a simple symmetric figure with respect to a specific line of symmetry **Symmetric figures**	interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs **Interpret charts** **Introducing line graphs** **Line graphs** Collect data, measuring where necessary. They work with a range of data, such as shoe size and width of shoe across the widest part of the foot, the number of letters in children's names, the width of their hand spans, the distance around their neck and wrist, data from nutrition panels on cereal packets, and so on. **Comparison, sum and difference** Undertake one or more of three enquiries: •What vehicles are very likely to pass the school gate between 10:00 am and 11:00 am? Why? What vehicles would definitely not pass by? Why not? What vehicles would be possible but not very likely? Why? What if it were a different time of day? What if the weather were different?	describe positions on a 2-D grid as coordinates in the first quadrant Describe position Draw on a grid Here is a shaded square. Write the coordinates for point A describe movements between positions as translations of a given unit to the left/right and up/down Move on a grid Describe movement This triangle is translated two squares to the left and one square down. Give the coordinates of its vertices in the new position plot specified points and draw sides to complete a given polygon A, B and C are three corners of a rectangle. What are the coordinates of the fourth corner?
Nrich links		**1**	**1** **2** **3**	**1** **2** **3** **4** **5** **6** **7** **8** **9**	**1** **2** **3**
NCTEM conditional knowledge	Odd one out. s¾ 9/12 4/6 9/12 10/15 2/3 Why? Write a decimal numbers (to one decimal place) which lies between a half and three quarters? ... and another, ... and another Ordering Put these numbers in the correct order, starting with the smallest. ¼ 0.75 5/10 4/8 ¾ 1/4	**Top Tips** Put these amounts in order starting with the largest. Explain your thinking Half of three litres; Quarter of two litres; 300 ml Write more statements One battery weighs the same as 60 paperclips; One pencil sharpener weighs the same as 20 paperclips. Write down some more things you know. How many pencil sharpeners weigh the same as a battery? The answer is .... 225 metres What is the question?	Undoing: Imran's swimming lesson lasts 50 minutes and it takes 15 minutes to change and get ready for the lesson. What time does Imran need to arrive if his lesson finishes at 6.15pm? Explain thinking The time is 10:35 am. Jack says that the time is closer to 11:00am than to 10:00am. Is Jack right? Explain why. Working backwards Put these times of the day in order, starting with the earliest time. A: quarter to four in the afternoon A: 07:56 B: six minutes to nine in the evening C: 14:36 What do you notice? 1:00pm = 13:00 2:00pm = 14:00 Continue the pattern	True or false? (Looking at a graph showing how the class sunflower is growing over time) "Our sunflower grew the fastest in July". Is this true or false? Convince me. Make up your own 'true/false' statement about the graph. What's the same, what's different? Pupils identify similarities and differences between different representations and explain them to each other Create a question Pupils ask (and answer) questions about different statistical representations using key vocabulary relevant to the objectives.	What's the same, what's different about the diagonals of these 2-D shapes? Visualising Imagine a square cut along the diagonal to make two triangles. Describe the triangles. Join the triangles on different sides to make new shapes. Describe them. (you could sketch them). Are any of the shapes symmetrical? Always, sometimes, never Is it always, sometimes or never true that the two diagonals of a rectangle meet at right angles? Other possibilities Can you show or draw a polygon that fits both of these criteria? What do you look for? "Has exactly two equal sides." "Has exactly two parallel sides."	Other possibilities Can you draw a non-right angled triangle with a line of symmetry? Are there other possibilities? Convince me Ayub says that he can draw a right angled triangle which has another angle which is obtuse. Is he right? Explain why.

Maths Curriculum Map – Year 5 (Autumn)

Number		Geometry		Measure		Statistics	

	Week 1-3 Block 1	Week 4-5 Block 2	Week 6-8 Block 4	Week 9-12 Block 5
	Place Value	**Addition and Subtraction**	**Multiplication and Division**	**Fractions A**
KIRFs	**To know how to round number to 1 million to the nearest 10, 100, 1000**		**To know the multiples and factors for all times tables up to 12 × 12**	
vocab	Round, columns, digits, nearest, middle, thousands, ten, hundreds, million	Can you round 23, 822 to the nearest 10, 100 , 1000? 1349 roundest to the nearest 10 is 1350 is that true or false and why?	They should be able to answer these questions in any order, including missing number questions e.g. 7 × ◯ = 28 or ◯ ÷ 6 = 7.	What is 12 **multiplied by** 6? What is 7 **times** 8? What is 84 **divided by** 7?
Declarative SK	• add and subtract numbers mentally with increasingly large numbers • know number bonds to 1 and to the next whole number • add to the next 10 from a decimal number, *e.g., 13·6 + 6·4 = 20*		• add and subtract numbers with two significant digits only, using mental strategies [3.4 + 4.8 or 23,000 + 47,000 / 6.2-4.5 or 72,000-47,000] • add and subtract one or two-digit multiples of 10, 100, 1000, 10,000 and 100,000 [8000 + 7000 or 600,000 + 700,000 / 8000-3000 or 600,000-200,000] add and subtract near multiples of 10, 100, 1000, 10,000 and 100,000 to other numbers [82,472 + / - 30,004]	
Learning End Points (White Rose)	Number to 10,000. •Roman numerals to 1,000. •Round to the nearest 10, 100 and 1000. •Number to 100,000. •Compare and order numbers to 100,000. •Round numbers within 100,000. •Numbers to a million. •Counting in 10s, 100s, 1,000s, 10,000s and 100,000s. •Compare and order numbers to a million. •Round numbers to a million. •Negative numbers.	Add whole numbers with more than 4-digits (column method). •Subtract whole numbers with more than 4-digits (column method). •Round to estimate and approximate. •Inverse operations (addition and subtraction). •Multi-step addition and subtraction problems.	Multiples. •Factors. •Common factors. •Prime numbers. •Square numbers. •Cube numbers. •Multiplying by 10, 100 and 1000. •Dividing by 10, 100 and 1000. •Multiples of 10, 100 and 1000	Equivalent fractions. •Improper fractions to mixed numbers. •Mixed numbers to improper fractions. •Number sequences. •Compare and order fractions less than 1. •Compare and order fractions greater than 1. •Add and subtract fractions. •Add fractions within 1. •Add 3 or more fractions. •Add fractions.
Procedural NC know	Read, write, order and compare numbers to at least 1000000 and determine the value of each digit. •Count forwards or backwards in steps of powers of 10 for any given number up to 1000000. •Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers including through zero. •Round any number up to 1000000 to the nearest 10, 100, 1000, 10000 and 100000. •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.	Add and subtract numbers mentally with increasingly large numbers. •Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction). •Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy. •Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.	Identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers. •Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. •Establish whether a number up to 100 is prime and recall prime numbers up to 19. •Multiply numbers up to 4 digits by a one-or two-digit number using a formal written method, including long multiplication for two-digit numbers. •Multiply and divide numbers mentally, drawing upon known facts. •Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context. •Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000. •Recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³). •Solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes. •Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign. •Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.	Compare and order fractions whose denominators are multiples of the same number. •Identify, name and write equivalent fractions of a given fraction, represented visually including tenths and hundredths. •Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements >1 as a mixed number [for example $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$]. •Add and subtract fractions with the same denominator and denominators that are multiples of the same number. •Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. •Read and write decimal numbers as fractions [for example 0.71 = $\frac{71}{100}$]. •Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.
Specific block Vocab	ones (1s), tens (10s), hundreds (100s), thousands (1,000s), ten thousands (10,000s), hundred thousands (100,000s), million (1,000,000), round, order, ascending, descending, less than (<), greater than (>), sequence.	Add, subtract, ones (1s), tens (10s) hundreds (100s), thousands (1,000s), ten thousands (10,000s), mentally, inverse, round, estimate, sum.	prime number, composite number, square number, cube number, square (2), cube (3), inverse operation, multiply, divide, multiple, factor, prime factor.	Equivalent, numerator, denominator, whole, fraction, simplify, division, mixed number, convert, sequence, proper fraction, improper fraction, convert, common denominator, fraction of an amount.

NCTEM STEM sentences				
	The Big Ideas Large numbers of six digits are named in a pattern of three: hundreds of thousands, tens of thousands, ones of thousands, mirroring hundreds, tens and ones. It is helpful to relate large numbers to real-world contexts, for example the number of people that a local sports arena can hold.	**The Big Ideas** Before starting any calculation is it helpful to think about whether or not you are confident that you can do it mentally. For example, 3689 + 4998 may be done mentally, but 3689 + 4756 may require paper and pencil. Carrying out an equivalent calculation might be easier than carrying out the given calculation. For example 3682 – 2996 is equivalent to 3686 – 3000 (constant difference).	**The Big Ideas** Pupils have a firm understanding of what multiplication and division mean and have a range of strategies for dealing with large numbers, including both mental and standard written methods. They see the idea of factors, multiples and prime numbers as connected and not separate ideas to learn. They recognise how to use their skills of multiplying and dividing in new problem solving situations. Fractions and division are connected ideas: 36÷18=36=2;18=1 36 2 Factors and multiples are connected ideas: 48 is a multiple of 6 and 6 is a factor of 48.	**The Big Ideas** Representations that may appear different sometimes have similar underlying ideas. For example 1 4, 0·25 and 25% are used in different contexts but are all connected to the same idea.
Links	**Teaching for Mastery Year 5**	**Teaching for Mastery Year 5**	**Teaching for Mastery Year 5**	**Teaching for Mastery Year 5**
White Rose Documents	count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 Count in powers of 10 Count from any given number in powers of 10 and decimal steps extending beyond zero when counting backwards; relate the numbers to their position on a number line Write the next number in this counting sequence: 110 000, 120 000, 130 000 ... Create a sequence that goes backwards and forwards in tens and includes the number 190. Describe your sequence. Here is part of a sequence: 30, 70, 110, □, 190, □. How can you find the missing numbers? interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through 0 Negative numbers Count from any given number in whole-number and decimal steps extending beyond zerowhen counting backwards; relate the numbers to their position on a number line. read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit Numbers to 10 000 Numbers to 100 000 Compare and order (100 000) Numbers to 1 000 000 Compare and order (1 000 000) Answer problems such as What is the value of the 7 in 3 274 105? Write in figures forty thousand and twenty. A number is partitioned like this: 4 000 000 + 200 000 + 60 000 + 300 + 50 + 8 Write the number. Now read it to me. A car costs more than £8600 but less than £9100. Tick the prices that the car might cost. read Roman numerals to 1000 (M) and recognise years written in Roman numerals Roman numerals Recognise Roman numerals in their historical context Read and write Roman numerals to one thousand *(Year 6 objective) identify the value of each digit to three decimal places* Year 5 Decimals up to 2 d.p. Year 5 Understanding thousandths round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 Round to the nearest 10, 100 and 1000 Round any numbers within 100 000 Round numbers to 1 000 000 Explain what each digit represents in whole numbers and decimals with up to two places and partition round and order these numbers and answer questions such as: What is 4773 rounded to the nearest hundred? round decimals with two decimal places to the nearest whole number and to one decimal place Rounding decimals	add and subtract numbers mentally with increasingly large numbers Compliments to 1 Respond rapidly to oral or written questions, explaining the strategy used, e.g. 750 take away 255, take 400 from 1360, 4500 minus 1050, subtract 3250 from 7600, 1800 less than 3300, 4000 less than 11 580 Derive quickly related facts, e.g. 80 + 50 = 130, 130 – 50 = 80, 800 + 500 = 1300, 1300 – 800 =500 Derive quickly number pairs that total 100 or pairs of multiples of 50 that total 1000, e.g. 32 + 68 = 100 or 150 + 850 = 1000 Identify and use near doubles, e.g. work out 28 + 26 = 54 by doubling 30 and subtracting first 2, then 4, or by doubling 26 and adding 2 Add or subtract the nearest multiple of 10, 100 or 1000 and adjust, e.g. adding or subtracting 9, 19, 29 ... to/from any two-digit number Work out mentally by counting up from a smaller to a larger number e.g. 8000 – 2785 is 5 + 10 + 200 + 5000 = 5215 Understand and use language associated with addition and subtraction, e.g. difference, sum, total add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) Add more than 4 digits Subtract more than 4 digits Add decimals within 1 Subtract decimals within 1 Add decimals – cross the whole Adding – same decimal places Subtracting – same decimal places Adding – different d.p. Subtracting – different d.p. Adding and subtracting wholes and decimals Use standard written methods for addition and subtraction, Adding and subtracting wholes and decimals e.g. calculate 14 136 + 3258 + 487 or 23 185 – 2078 Use written methods to find missing numbers in addition and subtraction calculations, e.g. 6432 + □ = 8025 Use written methods to add and subtract numbers with different numbers of digits, e.g. Find all the different totals that can be made using any three of these five numbers: 14 721, 76, 9534, 788, 6 solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why including understanding of the equals sign Multi-step problems Choose the appropriate operations to solve multi-step problems, decide whether the calculations can be done mentally or using a written method and explain and record how the problem was solved using numbers, signs and symbols. 13 502 people were at the match last week and there are 2483 more this week, how many more people need to attend to bring the total to the club's target of 20 000 people? Identify and obtain the necessary use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy Estimate and approximate Inverse Operations	multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000 Multiplying by 10, 100 and 1000 Dividing by 10, 100 and 1000 Multiples of 10, 100 and 1000 Multiply decimals by 10, 100 and 1000 Divide decimals by 10, 100 and 1000 Recall quickly multiplication facts up to 10 × 10 and use them to multiply pairs of multiples of 10 and 100 The product is 400. At least one of the numbers is a multiple of 10. What two numbers could have been multiplied together? Are there any other possibilities? multiply and divide numbers mentally, drawing upon known facts. identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers Multiples Factors Common factors Use the vocabulary factor, multiple and product. Identify all the factors of a given number; for example, the factors of 20 are 1, 2, 4, 5, 10 and 20. Answer questions such as: Find some numbers that have a factor of 4 and a factor of 5. What do you notice? My age is a multiple of 8. Next year my age will be a multiple of 7. How old am I? recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³) Square numbers Cube numbers Solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes Use knowledge of multiplication facts to derive quickly squares of numbers to 12 × 12 and the corresponding squares of multiples of 10. They should be able to answer problems such as: Tell me how to work out the area of a piece of cardboard with dimensions 30 cm by 30 cm Find two square numbers that total 45 know and use the vocabulary of prime numbers, prime factors and composite (non- prime) numbers establish whether a number up to 100 is prime and recall prime numbers up to 19 Prime numbers Recognise that numbers with only two factors are prime numbers and can apply their knowledge of multiples and tests of divisibility to identify the prime numbers less than 100. Explain that 73 children can only be organised as 1 group of 73 or 73 groups of 1, whereas 44 children could be organised as 1 group of 44, 2 groups of 22, 4 groups of 11, 11 groups of 4, 22 groups of 2 or 44 groups of 1. Explore the pattern of primes on a 100-square, explaining why there will never be a prime number in the tenth column and the fourth column solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates Cream cheese costs £3.60 per kilogram Bobby spends 90p on a pot of cream cheese. How much cheese does Bobby buy? Stefan only has 300ml of cream, how much chocolate should he use? solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes	recognise mixed numbers and improper fractions and convert from one form to the other. Write mathematical statements >1 as a mixed number **Improper to mixed numbers** **Mixed numbers to improper** **Count in fractions** How many halves in: 1 ½ 3 ½ 9 ½ ...? How many quarters in 1 ¼ 2 ¼ 5 ¼ ....? **Fraction of an amount** **Fractions as operators** identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths **Equivalent fractions** compare and order fractions whose denominators are all multiples of the same Number **Compare and order (less than 1)** **Compare and order (more than 1)** Children should be able to circle the two fractions that have the same value, or choose which one is the odd one out and justify their decision. 6/10, 3/5, 18/20,9/15
Nrich links	1 2 3 4 5 6 7 8	1 2 3 4 5	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	1
NCTEM conditional knowledge	Do, then explain Show the value of the digit 5 in these numbers? Explain how you know. Make up an example/Give further examples Create six digit numbers where the digit sum is five and the thousands digit is two. e.g. 3002000 2102000 What is the largest/smallest number? Do, then explain 747014, 774014, 747017, 774077, 744444 If you wrote these numbers in order starting with the smallest, which number would be third? Possible answers A number rounded to the nearest thousand is 76000. What is the largest possible number it could be? What do you notice? Round 343997 to the nearest 1000. Round it to the nearest 10000. What do you notice? Can you suggest other numbers like this? Do, then explain Circle each decimal which when rounded to one decimal place is 6.2. 6.32 6.23 6.27 6.17 Explain your reasoning Top tips Explain how to round decimal numbers to one decimal place? Making links 7 x 8 = 56 How can you use this fact to solve these calculations? 0.7 x 0.8 = 5.6 ÷ 8 = ndoing I divide a number by 100 and the answer is 0.33 What number did I start with? Another and another Write down a number with gives an answer between 33 and 38. . and another, ... and another,	True or false? Are these number sentences true or false? 6.17 + 0.4 = 6.57 8.12 – 0.9 = 8.3 Give your reasons. Hard and easy questions Which questions are easy / hard? 213323 - 70 = 512893 + 300 = 819354 - 500 = 319954 + 100 = Explain why you think the hard questions are hard? Making an estimate Which of these number sentences have the answer that is between 0.5 and 0.6? 11.74 - 11.18 33.3 – 32.71 Always, sometimes, never Is it always, sometimes or never true that the sum of four even numbers is divisible by 4?	Always, sometimes, never? Is it always, sometimes or never true that multiplying a number always makes it bigger Is it always, sometimes or never true that prime numbers are odd. Is it always, sometimes or never true that when you multiply a whole number by 9, the sum of its digits is also a multiple of 9 Is it always, sometimes or never true that a square number has an even number of factors?	Give an example of a fraction that is more than three quarters. Now another example that no one else will think of. Explain how you know the fraction is more than three quarters. What do you notice? Find 30/100 of 200 Find 3/10 of 200 What do you notice? Can you write any other similar statements?

Maths Curriculum Map – Year 5 (Spring)

Number		Geometry		Measure		Statistics	

	Week 1-3 Block 1	Week 4-5 Block 2	Week 6-8 Block 3	Week 9 – 10 Block 4	Week 11 – 12 Block 5
	Multiplication and Division	**Fractions B**	**Decimals and Percentages**	**Perimeter and Area**	**Statistics**
KIRFs	**To know and identify prime numbers up to 50.**		**To know and recall square numbers up to 12^2 and their square roots**		
vocab	prime number composite number factor multiple	To know the following numbers are prime numbers: 2, 3, 5, 7, 11, 13, 17, 19 To know a composite number is divisible by a number other than 1 or itself. To know the following numbers are composite numbers: 4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20 To know how to explain how they know that a number is composite. E.g. 15 is composite because it is a multiple of 3 and 5.	To know and be able to recognise whether a number below 150 is a square number or not	What is 8 **squared?** What is 7 **multiplied by itself?** What is the **square root** of 144? Is 81 a **square number**?	
Declarative SK	• add and subtract decimal numbers which are near multiples of 1 or 10, including money [*6·34 + / - 1·99 or £34·59 + / - £19·95*] • use counting up subtraction with knowledge of number bonds to 10/100 or £1 [£10-£3.45] • use place value and number facts to add two or more friendly numbers including money and decimals. [3 + 8 + 6 + 4 + 7, 0.6 + 0.7 + 0.4, or 2,056 + 44]		• know by heart all of the multiplication and division facts up to 12x12 • multiply and divide whole numbers and those involving decimals by 10, 100, 1000 and 10,000 • recognise and use square numbers and cube numbers, and the notation for squared and cubed use doubling and halving as mental multiplication and division strategies [58x5 is equal to (58x10) ÷ 2 / 34 ÷ 5 is equal to (34 ÷ 10) x 2]		
Learning End Points (White Rose)	Multiply 4-digits by 1-digit. •Multiply 2-digits (area model). •Multiply 2-digits by 2-digits. •Multiply 3-digits by 2-digits. •Multiply 4-digits by 2-digits. •Divide 4-digits by 1-digit. •Divide with remainders.	•Add mixed numbers. •Subtract fractions. •Subtract mixed numbers. •Subtract –breaking the whole. •Subtract 2 mixed numbers. •Multiply unit fractions by an integer. •Multiply non-unit fractions by an integer. •Multiply mixed numbers by integers. •Fraction of an amount. •Using fractions as operators.	Decimals up to 2 d.p. •Decimals as fractions (1). •Decimals as fractions (2). •Understand thousandths. •Thousands as decimals. •Rounding decimals. •Order and compare decimals. •Understand percentages. •Percentages as fractions and decimals. •Equivalent F.D.P.	Measure perimeter. •Calculate perimeter. •Area of rectangles. •Area of compound shapes. •Area of irregular shapes.	Read and interpret line graphs. •Draw line graphs. •Use line graphs to solve problems. •Read and interpret tables. •Two-way tables. •Timetables.
Procedural NC know	Multiply and divide numbers mentally drawing upon known facts. •Multiply numbers up to 4 digits by a one or two digit number using a formal written method, including long multiplication for 2 digit numbers. •Divide numbers up to 4 digits by a one digit number using the formal written method of short division and interpret remainders appropriately for the context. •Solve problems involving addition and subtraction, multiplication and division and a combination of these, including understanding	Compare and order fractions whose denominators are multiples of the same number. •Identify, name and write equivalent fractions of a given fraction, represented visually including tenths and hundredths. •Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements >1 as a mixed number [for example $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$]. •Add and subtract fractions with the same denominator and denominators that are multiples of the same number. •Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. •Read and write decimal numbers as fractions [for example $0.71 = {}^{71}/_{100}$]. •Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.	Read, write, order and compare numbers with up to three decimal places. •Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents. •Round decimals with two decimal places to the nearest whole number and to one decimal place. •Solve problems involving number up to three decimal places. •Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal. •Solve problems which require knowing percentage and decimal equivalents of ½, ¼, ⅕, ⅖, ⅘ and those fractions with a denominator of a multiple of 10 or 25.	Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres. •Calculate and compare the area of rectangles (including squares), including using standard units, square centimetres (cm²) and square metres (m²), and estimate the area of irregular shapes.	Solve comparison, sum and difference problems using information presented in a line graph. •Complete, read and interpret information in tables including timetables.
Specific block Vocab	Equal, multiply, divide, times-table, sharing, grouping, array, bar model, remainder, repeated addition, multiplication sentence, division statement, division fact, partition, place holder.	Equivalent, numerator, denominator, whole, fraction, simplify, division, mixed number, convert, sequence, proper fraction, improper fraction, convert, common denominator, fraction of an amount.	decimal place, tenth, hundredth, thousandth, decimal point, place value, digit, fraction, per cent (%), percentage, one decimal place, two decimal places.	Perimeter, distance, area, space, length, width, centimetre, square centimetre (cm2), metre square metre (m2), scale, compare, estimate.	Graph, line graph, table, horizontal, vertical, two-way table, scale, axis/axes, data, plot/plotted, tallies/tally, digits.

NCTEM STEM sentences	**The Big Ideas** Representations that may appear different sometimes have similar underlying ideas. For example, 1 4, 0·25 and 25% are used in different contexts but are all connected to the same idea.	**The Big Ideas** Representations that may appear different sometimes have similar underlying ideas. For example, 1 4, 0·25 and 25% are used in different contexts but are all connected to the same idea.	**The Big Ideas** Representations that may appear different sometimes have similar underlying ideas. For example 1 4, 0·25 and 25% are used in different contexts but are all connected to the same idea.	**The Big Ideas** The relationship between area and perimeter is not a simple one. Increasing or decreasing area does not necessarily mean the perimeter increases or decreases respectively, or vice versa. Area is measured in square units. For rectangles, measuring the length and breadth is a shortcut to finding out how many squares would fit into each of these dimensions.	**The Big Ideas** Different representations highlight different aspects of data. It is important to be able to answer questions about data using inference and deduction, not just direct retrieval.
Links	**Teaching for Mastery Year 5**	**Teaching for Mastery Year 5**	**Teaching for Mastery Year 5**	**Teaching for Mastery Year 5**	**Teaching for Mastery Year 5**
White Rose Documents	multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers Multiply 4-digits by 1-digit Multiply 2-digits (area model) Multiply 2-digits by 2-digits Multiply 3-digits by 2-digits Multiply 4-digits by 2-digits Move from expanded layouts (such as the grid method) towards a compact layout for HTU × U and TU × TU calculations. Suggest what the approximate answer to be before starting a calculation and use this to check that the answer sounds sensible. For example, 56 × 27 is approximately 60 × 30 = 1800. 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 Divide 4-digits by 1-digit Divide with remainders Extend written methods for division to include HTU ÷ U, including calculations with remainders. Suggest an approximate answer before starting a calculation and use this to check that the answer sounds sensible. Increase the efficiency of the methods being used for example: 196 ÷ 6 is approximately 200 ÷ 5 = 40 32 r4 or 4/6 or 2/3 (as well as using short division methods) Know that, depending on the context, answers to division questions may need to be rounded up or rounded down. Explain whether to round up or down to answer problems such as: - Egg boxes hold 6 eggs. A farmer collects 439 eggs. How many boxes can he fill? - Egg boxes hold 6 eggs. How many boxes must a restaurant buy to have 200 eggs? use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy Use rounding to approximate and check e.g. 2593 + 6278 must be more than 2500 + 6200 2403 – 1998 is about 2400 – 2000 Write approximate answers to calculations, e.g. write an approximate answer for 516 ÷ (15 + 36)	recognise mixed numbers and improper fractions and convert from one form to the other. Write mathematical statements >1 as a mixed number Improper to mixed numbers Mixed numbers to improper Count in fractions How many halves in: 1 ½ 3 ½ 9 ½ ...? How many quarters in 1 ¼ 2 ¼ 5 ¼ ....? (Year 3 objective) recognise and use fractions as numbers: Fraction of an amount Fractions as operators identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths Equivalent fractions compare and order fractions whose denominators are all multiples of the same number Compare and order (less than 1) Compare and order (more than 1) Children should be able to circle the two fractions that have the same value, or choose which one is the odd one out and justify their decision. 6/10, 3/5, 18/20,9/15	(Year 4 objective) count up and down in hundredths read, write, order and compare numbers with up to three decimal places Order and compare decimals Write these numbers in order of size, starting with the smallest. 1.01, 1.001, 1.101, 0.11 Put the correct symbol, < or >, in each box. 3.03 ☐ 3.3 0.37 ☐ 0.327. Order these numbers: 0.27 0.207 0.027 2.07 2.7 read and write decimal numbers as fractions (e.g. 0.71 = $^{71}/_{100}$) Decimals and fractions (1) Decimals and fractions (2) What decimal is equal to 25 hundredths? Write the total as a decimal: 4 + $^{6}/_{10}$ + $^{2}/_{100}$ = Children partition decimals using both decimal and fraction notation, for example, recording 6.38 as 6 + $^{3}/_{10}$ + $^{8}/_{100}$ and as 6 + 0.3 + 0.08. recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents Thousandths as decimals Recognise that 0.007 is equivalent to $^{7}/_{1000}$ 6.305 is equivalent to $^{6305}/_{100}$ write percentages as a fraction with denominator 100, and as a decimal % Fractions and decimals Equivalent FDP Which is bigger: 65% or ¾? How do you know? What percentage is the same as 7/10? Explain how you know? Which is the odd one out in each of these What is 31/100 as a percentage? Which is a better mark in a test: 61%, or 30 out of 50? How do you know?	measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres Measure perimeter Calculate perimeter calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm) and square metres (m2) and estimate the area of irregular shapes Area of rectangles Area of compound shapes Area of irregular shapes Calculate the area of a rectangle which is eleven metres long by 5 metres wide. Which has the greatest area – a square with sides 6 cm long or a rectangle which is 7 cm long by 5 cm? How much greater is the area?	complete, read and interpret information in tables, Read and interpret tables Two way tables I can find the information in a table or graph to answer a question Solve comparison, sum and difference problems using information presented in a line graph Read and interpret line graphs Draw line graphs Problems with line graphs Begin to decide which representations of data are most appropriate and why. Connect work on co-ordinates and scales to interpret time graphs
Nrich links	1 2 3	1		1 2 3 4 5 6 7 8 9 10	
NCTEM conditional knowledge	**Use a fact** 3 x 75 = 225 Use this fact to work out 450÷6= 225 ÷ 0.6 = To multiply by 25 you multiply by 100 and then divide by 4. Use this strategy to solve 48 x 25 4.6 x 25 **Use the inverse** Use the inverse to check if the following calculations are correct: 4321 x 12 = 51852 507 ÷ 9 = 4563 **Size of an answer** The product of a two digit and three digit number is approximately 6500. What could the numbers be?	**Give an example** of a fraction that is more than three quarters. Now another example that no one else will think of. Explain how you know the fraction is more than three quarters. **What do you notice?** Find 30/100 of 200 Find 3/10 of 200 What do you notice? Can you write any other similar statements?	**Spot the mistake** 0.088, 0.089, 1.0 What comes next? 1.173, 1.183, 1.193 **What do you notice?** One tenth of £41, One hundredth of £41, One thousandth of £41 Continue the pattern. What do you notice? 0.085 + 0.015 = 0.1 0.075 + 0.025 = 0.1 0.065 + 0.035 = 0.1 Continue the pattern for the next five number sentences. **True or false?** 0.1 of a kilometre is 1m. 0.2 of 2 kilometres is 2m. 0.3 of 3 Kilometres is 3m 0.25 of 3m is 500cm. 2/5 of £2 is 20p Missing symbol Put the correct symbol < or > in each box Odd one out. collections of 4 fractions? Put in Order Imran put these fractions in order starting with the smallest. Are they in the correct order? Two fifths, three tenths, four twentieths How do you know? Complete the pattern Another and another Write a fraction with a denominator of one hundred which has a value of more than 0.75? ... and another, ... and another, ... Ordering Put these numbers in the correct order, starting with the largest. Explain your thinking 7/10, 0.73, 7/100, 0.073 71%	**Testing Conditions** Shape A is a rectangle that is 4m long & 3m wide. Shape B is a square with sides 3m. The rectangles and squares are put together side by side to make a path which has perimeter between 20 & 30m. e.g Can you draw some other arrangements where the perimeter is between 20 &30 m? **Always, sometimes, never?** When you cut off a piece of a shape you reduce its area and perimeter.	**True or false?** (Looking at a train time table) "If I want to get to Exeter by 4 o'clock this afternoon, I will need to get to Taunton station before midday". Is this true or false? **Convince me.** Make up your own 'true/false' statement about a journey using the timetable. **What's the same, what's different?** Pupils identify similarities and differences between different representations and explain them to each other **Create a question** Pupils ask (and answer) questions about different statistical representations using key vocabulary relevant to the objectives.

Maths Curriculum Map – Year 5 (Summer)

Number		Geometry		Measure		Statistics	

	Week 1-3 Block 1	Week 4-5 Block 2	Week 6 - 8 Block 3	Week 9 Block 4	Week 10-11 Block 5	Week 12 Block 6
	Shape	**Position and Direction**	**Decimals**	**Negative numbers**	**Converting Units**	**Volume**
KIRFs	**To know the first 5 cube numbers**		**To know how to convert between improper fractions and mixed fractions**			
vocab	cube, square, digit, times, factors, multiples, diagram, prove, pattern, sequence	What is the cube of 3? what is the cube root? how do you know? how can you prove this?	fraction, percentage, decimal, decimal point, top heavy, denominator, numerator, whole number, part, improper fraction, mixed number, convert		multiply the numerator, divide the denominator how can you make it mixed?	
Declarative SK	• identify and use knowledge of multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • use partitioning to double and halve, including money • partition two-digit numbers, including decimals, to multiply by a single-digit number mentally [6x27 as 6x20 + 6x7 / 6.3x7 as 6x7 + 0.3x7]			• divide larger numbers mentally by subtracting the 10th and 100th multiple as appropriate [96÷10 is 10x6=60 and 6x6=36] • use common factors to simplify fractions; use common multiples to express fractions in the same denomination		
Learning End Points (White Rose)	Measuring angles in degrees. •Measuring with a protractor (1). •Measuring with a protractor (2). •Drawing lines and angles accurately. •Calculating angles on a straight line. •Calculating angles around a point. •Calculating lengths and angles in shapes. •Regular and irregular polygons. •Reasoning about 3D shapes	Position in the first quadrant. •Reflection. •Reflection with coordinates. •Translation. •Translation with coordinates.	Adding and subtracting decimals within 1. •Complements to 1. •Adding decimals –crossing the whole. •Adding decimals with the same number of decimal places. •Subtracting decimals with the same number of decimal places. •Adding and subtracting decimals with a different number of decimal places. •Adding and subtracting whole and decimals. •Decimal sequences. •Multiplying decimals by 10, 100 and 1000. •Dividing decimals by 10, 100 and 1,000.	• Negative numbers • Round number to 1 million	Kilograms and kilometres. •Milligrams and millilitres. •Metric units. •Imperial units. •Converting units of time. •Timetables.	What is volume? •Compare volume. •Estimate volume. •Estimate capacity.
Procedural NC know	Identify 3D shapes, including cubes and other cuboids, from 2D representations. •Use the properties of rectangles to deduce related facts and find missing lengths and angles. •Distinguish between regular and irregular polygons based on reasoning about equal sides and angles. •Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles. •Draw given angles, and measure them in degrees. •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 90°.	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.	Solve problems involving number up to three decimal places. •Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. •Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.	Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers including through zero. •Round any number up to 1000000 to the nearest 10, 100, 1000, 10000 and 100000. •Solve number problems and practical problems that involve all of the above	Convert between different units of metric measure [for example, km and m; cm and m; cm and mm; g and kg; l and ml]. •Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints. •Solve problems involving converting between units of time.	Estimate volume [for example using 1cm3 blocks to build cuboids •(including cubes)] and capacity [for •example, using water]. •Use all four operations to solve problems involving measure.
Specific block Vocab	Angle, whole turn, right angle, acute angle, obtuse angle, reflex angle, degree (°), interior angle, clockwise, anticlockwise, orientation, parallel, perpendicular, right angle, interior angle, quadrilateral, regular, irregular, 3D shape, pyramid, sphere, cone, hexagon, pentagon, triangle.	Reflection, translation, vertex, vertices, coordinates, mirror line, horizontal axis, vertical axis, quadrant.	Decimal place, tenth, hundredth, thousandth, decimal point, place value, digit, fraction, per cent (%), percentage, one decimal place, two decimal places.		Convert, metric unit, imperial unit, kilo, kilogram, gram, millimetre, centimetre, metre, kilometre, litre, millilitre, pound (lb), ounce (oz), inch (in), foot (ft), yard (yd), pint, gallon, stone (st), approximately.	Volume, solid, capacity, calculate, estimate, cube.

NCTEM STEM sentences	The Big Ideas During this year, pupils increase the range of 2-D and 3-D shapes that they are familiar with. With 3-D shapes they think about the faces as well as the number of vertices and through considering nets think about the 2-D shapes that define the 3-D shapes. Pupils learn about a range of angle facts and use them to describe certain shapes and derive facts about them. Regular shapes have to have all sides and all angles the same. Although non-square rectangles have four equal angles, the fact that they do not have four equal sides means that they are not regular. Some properties of shapes are dependent upon other properties. For example, a rectangle has opposite sides equal because it has four right angles. A rectangle is defined as a quadrilateral with four right angles. It does not have to be defined as a quadrilateral with four right angles and two pairs of equal sides.		The Big Ideas Representations that may appear different sometimes have similar underlying ideas. For example, 1 4, 0·25 and 25% are used in different contexts but are all connected to the same idea.	The Big Ideas Large numbers of six digits are named in a pattern of three: hundreds of thousands, tens of thousands, ones of thousands, mirroring hundreds, tens and ones. It is helpful to relate large numbers to real-world contexts, for example the number of people that a local sports arena can hold.	The Big Ideas The smaller the unit, the greater the number of unit s needed to measure (that is, there is an inverse relationship between size of unit and measure).	**The Big Ideas** Developing benchmarks to support estimation skills is important as pupils become confident in their use of standard measures. The height of a door frame, for example, is approximately 2 metres, and a bag of sugar weighs approximately 1 kilogram.
Links	**Teaching for Mastery Year 5**	**Teaching for Mastery Year 5**	**Teaching for Mastery Year 5**		**Teaching for Mastery Year 5**	**Teaching for Mastery Year 5**
White Rose Documents	Identify 3D shapes, including cubes and other cuboids, from 2D representations Reasoning about 3D shapes Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles Year 6 Introduce angles Draw given angles, and measure them in degrees (°) Measuring angles in degrees Measure with a protractor (1) Measure with a protractor (2) Draw accurately Children become accurate in drawing lines with a ruler to the nearest millimetre and measuring with a protractor. Children use conventional markings for parallel lines and right angles Use the properties of rectangles to deduce related facts and find missing lengths and angles. Lengths and angles Distinguish between regular and irregular polygons based on reasoning about equal sides and angles Regular and irregular polygons identify angles at a point and one whole turn (total 360°), angles at a point on a straight line and a half turn (total 180°) and other multiples of 90° Angles on a straight line Angles round a point	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 Position in the first quadrant Translation Translation with coordinates 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 Reflection Reflection with coordinates	Add decimals within 1 Subtract decimals within 1 Add decimals – cross the whole Adding – same decimal places Subtracting – same decimal places Adding – different d.p. Subtracting – different d.p. Adding and subtracting wholes and decimals Children add decimals within one whole. They use place value counters and place value charts to support adding decimals and understand what happens when we exchange between columns. Children build on their understanding that 0.45 is 45 hundredths, children can use a hundred square to add decimals multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000 Multiplying by 10, 100 and 1000 Dividing by 10, 100 and 1000 Multiples of 10, 100 and 1000 Multiply decimals by 10, 100 and 1000 Divide decimals by 10, 100 and 1000 Recall quickly multiplication facts up to 10 × 10 and use them to multiply pairs of multiples of 10 and 100 The product is 400. At least one of the numbers is a multiple of 10. What two numbers could have been multiplied together? Are there any other possibilities? 10478 10424 10421	Negative numbers Count from any given number in whole-number and decimal steps extending beyond zero when counting backwards; relate the numbers to their position on a number line. read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit Numbers to 10 000 Numbers to 100 000 Compare and order (100 000) Numbers to 1 000 000 Compare and order (1 000 000)	use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) Kilograms and kilometres Milligrams and millilitres Metric units What is two hundred and seventy-six centimetres to the nearest metre? How many millimetres are in 3 centimetres? Imperial units This bag of sugar weighs 1kg. Approximately how many pounds (lb) of sugar would fit into another empty bag of the same size as this one? Tick the correct answer. 20lb 14lb 2lb 4lb Children should be able to draw a flow chart to help someone else convert between mm, cm, m and km. They should know the approximate equivalence between commonly used imperial units and metric units convert between miles and kilometres Miles and kilometres 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 up to up to three decimal places Convert metric measures Look at the scale. Estimate the number of centimetres that are equal to 2 ½ feet. Estimate the difference in centimetres between 50 cm and 1 foot. solve problems involving converting between units of time Converting units of time Kirsty ran a race in one and half minutes. Mina took ten seconds longer to finish. How many seconds did Mina take? Stefan's watch shows the time five minutes past nine. Stefan's watch is 12 minutes fast. What is the correct time? complete, read and interpret information in tables, including timetables Timetables Timetables (2) I can find the information in a table or graph to answer a question. The table shows the cost of coach tickets to different cities. What is the total cost for a return journey to York for one adult and two children?	estimate volume - for example, using 1 cm3 blocks to build cuboids (including cubes) and capacity (for example, using water) What is volume? Compare volume Estimate volume Estimate capacity Fill various containers with water. Ask children to order them by smallest to largest volume of water. Estimate the volume of water in each container and check by emptying into a measuring jug and checking solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate Metric measures Calculate with metric measures Imperial measures
Nrich links	1 2 3 4 5 6	1 2	1 2 3			
NCTEM conditional knowledge	**What's the same, what's different about the net of a cube and the net of a cuboid?** **Visualising** **I look at a large cube which is made up of smaller cubes. If the larger cube is made up of between 50 and 200 smaller cubes what might it look like?** **Always, sometimes, never** **Is it always, sometimes or never true that the number of lines of reflective symmetry in a regular polygon is equal to the number of its sides n?** **Other possibilities** **A rectangular field has a perimeter between 14 and 20 metres . What could its dimensions be?** **Other possibilities** **Here is one angle of an isosceles triangle. You will need to measure the angle accurately.** **What could the other angles of the triangle be?** **Are there any other possibilities?** **Convince me** **What is the angle between the hands of a clock at four o clock? At what other times is the angle between the hands the same?**	Top Tips Put these amounts in order starting with the largest. 130000cm2 1.2 m2 13 m2 Explain your thinking The answer is .... 0.3km What is the question? Write more statements Mr Smith needs to fill buckets of water. A large bucket holds 6 litres and a small bucket holds 4 litres. If a jug holds 250 ml and a bottle holds 500 ml suggest some ways of using the jug and bottle to fill the buckets. Undoing A school play ends at 6.45pm. The play lasted 2 hours and 35 minutes. What time did it start? Working backwards Put these lengths of time in order starting with the longest time. 105 minutes 1 hour 51 minutes 6360 seconds What do you notice? What do you notice here? 1 minute = 60 seconds 60 minutes = seconds Fill in the missing number of seconds Write down some more time facts like this.	Spot the mistake 0.088, 0.089, 1.0 What comes next? 1.173, 1.183, 1.193 What do you notice? One tenth of £41, One hundredth of £41, One thousandth of £41 Continue the pattern. What do you notice? 0.085 + 0.015 = 0.1 0.075 + 0.025 = 0.1 0.065 + 0.035 = 0.1 Continue the pattern for the next five number sentences. True or false? 0.1 of a kilometre is 1m. 0.2 of 2 kilometres is 2m. 0.3 of 3 Kilometres is 3m 0.25 of 3m is 500cm. 2/5 of £2 is 20p Missing symbol Put the correct symbol < or > in each box Odd one out. collections of 4 fractions? Put in Order Imran put these fractions in order starting with the smallest. Are they in the correct order? Two fifths, three tenths, four twentieths How do you know? Complete the pattern Another and another Write a fraction with a denominator of one hundred which has a value of more than 0.75? ... and another, ... and another, ... Ordering put these numbers in the correct order, starting with the largest. Explain your thinking 7/10, 0.73, 7/100, 0.073 71%	True or False? The temperature outside is 5- degrees, the temperature inside is 25 degrees. The difference is 20 degrees. Four less than negative 6 is negative 2 15 more than -2 is 15. Explain how you know each statements is true or false. Put these statements in order so that the answers are from smallest to greatest: The difference between -24 and – 26 The even number that is less than -18 but greater than -22 The number that is half way between 40 and -50. The difference between -6 and 7.	calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm 2) and square metres (m 2) and estimate the area of irregular shapes (also included in measuring) Undoing A school play ends at 6.45pm. The play lasted 2 hours and 35 minutes. What time did it start?	Testing conditions Shape A is a rectangle that is 4m long & 3m wide. Shape B is a square with sides 3m. The rectangles and squares are put together side by side to make a path which has perimeter between 20 & 30m. e.g. Can you draw some other arrangements where the perimeter is between 20 &30 m? Always, sometimes, never? When you cut off a piece of a shape you reduce its area and perimeter. Other possibilities A cuboid is made up of 36 smaller cubes. If the cuboid has the length of two of its sides the same what could the dimensions be?

Maths Curriculum Map – Year 6 (Autumn)

Number		Geometry		Measure		Statistics	

	Week 1-2 Block 1	Week 3-7 Block 2	Week 8-9 Block 3	Week 10-11 Block 4	Week 12 Block 5
	Place Value	**Four Operations**	**Fractions A (Addition and subtraction)**	**Fractions B (Multiplication and division)**	**Converting Units**
KIRFs	**To know how to count in powers of ten forwards and backwards**		**To know how to identify common factors of a pair of numbers**		
vocab	multiples, power of ten, ten, hundred, thousand, ten thousand, hundred thousand, million	Count forward in steps of ten starting with ten thousand Count backwards in steps of ten from 1324	factor common factor multiple greatest common factor	*To know factors of a number are all numbers which divide it with no remainder. E.g. the factors of 24 are 1, 2, 3, 4, 6, 8, 12, and 24. The factors of 56 are 1, 2, 4, 7, 8, 14, 28 and 56.* *To know the common factors of two numbers are the factors they share.* *E.g. the common factors of 24 and 56 are 1, 2, 4 and 8.* *To know the greatest common factor of 24 and 56 is 8.* To know how to explain how they know that a number is a common factor. E.g. 8 is a common factor of 24 and 56 because 24 = 8 × 3 and 56 = 8 × 7.	
Declarative SK	• perform mental calculations, including with mixed operations and large numbers • know by heart all number bonds to 100 and use these to derive related facts [3.46 + 0.54 = 4] • use number bonds to 100 to support subtraction through complementary addition [1000 – 654 as 46 + 300] and quickly derive bonds to 1000		• add small and large whole numbers, using place value [34,000 + 8000] • add negative numbers in context such as temperature add two one-place decimal numbers or two-place decimal numbers less than 1 [4.5 + 6.3 or 0.24 + 0.33]		
Learning End Points (White	Numbers to ten million. Compare an order any number. Round any numbers. Negative numbers.	Add and subtract whole numbers. Multiply up to 4-digit by 2-digit number. Short division. Division using factors. Long division (1). Long division (2). Long division (3). Long division (4). Common factors. Common multiples. Primes. Squares and cubes. Order of operations. Mental calculations and estimation. Reasoning from known facts.	Simplify fractions. Fractions on a number line. Compare & order (denominator). Compare & order (numerator). Add & subtract fractions (1). Add & subtract fractions (2). Adding fractions. Subtracting fractions. Mixed addition and subtraction.	Multiply fractions by integers. Multiply fractions by fractions. Divide fractions by integers (1). Divide fractions by integers (2). Four rules with fractions. Fraction of an amount. Finding the whole.	Calculate with metric measures. Miles and kilometres. Imperial measures.
Procedural NC know	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.	Solve addition and subtraction multi step problems in contexts, deciding which operations and methods to use and why. Multiply multi-digit number up to 4 digits by a 2-digit number using the formal written method of long multiplication. Divide numbers up to 4 digits by a 2-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding as appropriate for the context. Divide numbers up to 4 digits by a 2-digit number using the formal written method of short division, interpreting remainders according to 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 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.	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. Solve problems which require answers to be rounded to specified degrees of accuracy. Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.	Multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. 1/4 × 1/2 = 1/8). Divide proper fractions by whole numbers (e.g. 1/3 ÷ 2 = 1/6). Associate a fraction with division to calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3/8). Identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places. 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 involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate. converting Use, read, write and convert between standard units, 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 3 d.p. Convert between miles and kilometres.
Specific block Vocab	ones (1s), tens (10s), hundreds (100s), thousands (1,000s), ten thousands (10,000s), hundred thousands (100,000s), million (1,000,000), ten million (10,000,000), round, order, ascending, descending, less than (<), greater than (>), sequence, positive, negative.	column addition, column subtraction, estimate, multiplication, short division, long division, remainder, factor, estimate, common factor, common multiple, prime, composite, squared (2), cubed (3), order of operations, brackets, inverse operation.	Equivalent, numerator, denominator, whole, fraction, simplify, division, mixed number, convert, sequence, proper fraction, improper fraction, convert, common denominator, fraction of an amount.		Convert, metric unit, imperial unit, kilo, kilogram, gram, millimetre, centimetre, metre, kilometre, litre, millilitre, pound (lb), ounce (oz), inch (in), foot (ft), yard (yd), pint, gallon, stone (st), approximately.

NCTEM STEM sentences	**The Big Ideas** For whole numbers, the more digits a number has, the larger it must be: any 4-digit whole number is larger than any 3-digit whole number. But this is not true of decimal numbers: having more digits does not make a decimal number necessarily bigger. For example, 0·5 is larger than 0·35. Ordering decimal numbers uses the same process as for whole numbers i.e. we look at the digits in matching places in the numbers, starting from the place with the highest value i.e. from the left. The number with the higher different digit is the higher number. For example, 256 is greater than 247 because 256 has 5 tens but 247 has only 4 tens. Similarly 1·0843 is smaller than 1·524 because 1·0843 has 0 tenths but 1·524 has 5 tenths.	**The Big Ideas** Deciding which calculation method to use is supported by being able to take apart and combine numbers in many ways. For example, calculating 8·78 + 5·26 might involve calculating 8·75 + 5·25 and then adjusting the answer. The associative rule helps when adding three or more numbers: 367 + 275 + 525 is probably best thought of as 367 + (275 + 525) rather than (367 + 275) + 525 **The Big Ideas** Standard written algorithms use the conceptual structures of the mathematics to produce efficient methods of calculation. Standard written multiplication method involves a number of partial products. For example, 36 × 24 is made up of four partial products 30 × 20, 30 × 4, 6 × 20, 6 × 4. There are connections between factors, multiples and prime numbers and between fractions, division and ratios.	**The Big Ideas** Fractions express a relationship between a whole and equal parts of a whole. Pupils should recognise this and speak in full sentences when answering a question involving fractions. For example, in response to the question 'What fraction of the journey has Tom Travelled?' the pupil might respond, 'Tom has travelled two thirds of the whole journey.' Equivalent fractions are connected to the idea of ratio: keeping the numerator and denominator of a fraction in the same proportion creates an equivalent fraction. Putting fractions in place on the number lines helps understand fractions as numbers in their own right.	**The Big Ideas** Fractions express a relationship between a whole and equal parts of a whole. Pupils should recognise this and speak in full sentences when answering a question involving fractions. For example, in response to the question 'What fraction of the journey has Tom Travelled?' the pupil might respond, 'Tom has travelled two thirds of the whole journey.' Equivalent fractions are connected to the idea of ratio: keeping the numerator and denominator of a fraction in the same proportion creates an equivalent fraction. Putting fractions in place on the number lines helps understand fractions as numbers in their own right.	**The Big Ideas** To read a scale, first work out how much each mark or division on the scale represents. The unit of measure must be identified before measuring. Selecting a unit will depend on the size and nature of the item to be measured and the degree of accuracy required.
Links	**Teaching for Mastery Year 6**	**Teaching for Mastery Year 6**	**Teaching for Mastery Year 6**		**Teaching for Mastery Year 6**
White Rose Documents	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (1) Numbers to ten million Compare and order any number Children should be able to determine the steps used in different scales use negative numbers in context, and calculate intervals across zero Negative numbers work with negative numbers in a similar way, determining values on a scale and estimating	perform mental calculations, including with mixed operations and large numbers e.g.230 – 96 + 92 – 15 Mental calculations Reason from known facts Division Using Factors Use mental strategies to calculate in their heads, using jottings and/or diagrams where appropriate for example, to calculate 24 × 15, they multiply 24 × 10 and then halve this to get 24 × 5, adding these two results together. They record their method as (24 × 10) + (24 × 5). Alternatively, they work out 24 × 5 = 120 half of 24 × 10), then multiply 120 by 3 to get 360. use their knowledge of the order of operations to carry out calculations involving the four operations Order of operations Add and subtract integers *Use standard written methods for addition and subtraction, e.g. calculate 15.98 + 26.314 and 125.48 – 72.3 Use written methods to find missing numbers in addition and subtraction calculations, e.g. 6.34 + □ = 10.345* *Use written methods to add and subtract numbers with different numbers of digits, and different numbers of decimal places e.g. Find all the different totals that can be made using any three of these five numbers: 14 311, 76, 0.546, 96.78, 780, 7.1* Multiply 4-digits by 2-digits Look at long-multiplication calculations containing errors, identify the errors and determine how they should be corrected. Solve word problems such as: Printing charges for a book are 3p per page dnd 75p for the cover. I paid £4.35 to get this ook printed. How many pages are there in the book? Write down the calculations that you did. Seeds are £1.45 for a packet. I have £10 to spend on seeds. What is the greatest number of packets I can buy? Divide numbers up to 4 digits by a 2 digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions or by rounding as appropriate for the context. Short division Long division (1) Long division (2) Long division (3) Long division (4) Every day a machine makes 100 000 paper clips, which go into boxes. A full box has 120 paper clips. How many full boxes can be made from 100 000 paper clips? Each paper clip is made from 9.2 centimetres of wire. What is the greatest number of paper clips that can be made from 10 metres of wire? A DJ has two different sized storage boxes for her CDs. Small boxes hold 15 CDs. Large boxes hold 28 CDs. The DJ has 411 CDs. How could the DJ pack her CDs? identify common factors and common multiples Common factors Common multiplesHow can you use factors to multiply 17 by 12? Start from a two-digit number with at least six factors, e.g. 72. How many different multiplication and division facts can you make using what you know about 72? What facts involving decimals can you derive? What if you started with 7.2? What about 0.72? use their knowledge of the order of operations to carry out calculations involving the four operations Find answers to calculations such as 5.6 = 0.7 or 3 × 0.6, drawing on their knowledge of number facts and understanding of place value. They should be able to approximate, use inverses and apply tests of divisibility to check their results. identify prime numbers Primes (Year 5 objective) recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³) Square and cube numbers Children should know the square numbers up to 12 × 12 and derive the corresponding squares of multiples of 10, for example 80 × 80 = 6400. E.g. 32 + 10 = solve problems involving multiplication and division Division to solve problems	(Year 5 objective) recognise mixed numbers and improper fractions and convert from one form to the other (Year 3 objective) recognise, find and write fractions of a discrete set of objects Fraction of an amount Finding the whole use common factors to simplify fractions; use common multiples to express fractions in the same denomination Simplify fractions Children should be able to recognise that a 5 fraction such as /20 can be reduced to an equivalent fraction of ¼ by dividing both numerator and denominator by the same number [cancelling] They should be familiar with identifying fractions in different units. E.g. what fraction is 20 pence of two pounds? Of four pounds etc... compare and order fractions, including fractions >1 Fractions on a number line Compare and order (denominator) Compare and order (numerator) Position fractions on a number line; e.g. mark Fractions such as 7/5 , 11/20 , 18/12 on a number line graduated in tenths What number is half way between 5¼ and 5½? associate a fraction with division to calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. ⅜) Decimals as fractions Fractions to decimals (1) Fractions to decimals (2) Children should be able to find fractions of numbers and quantities: What fraction of £1 is 35p, ... 170p ? Write 23/100 of 4 kilogrammes in grams What fraction of 1 litre is 413 ml? Convert a fraction to a decimal using known equivalent fractions: ¼ = 0.25 ⅖=0.4 Explain how much pizza each person would get if they divided 4 pizzas between 5 People, as a fraction and a decimal Circle the two fractions that are equivalent to 0.6. recall and use equivalences between simple fractions, decimals and percentages, including in different contexts Fractions to percentages Equivalent FDP Order FDP Put a ring around the percentage that is equal to three-fifths –This model is made of 20 cubes. What percentage of the model is made from black cubes? add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions Add and subtract fractions (1) Add and subtract fractions (2) Adding fractions Subtracting fractions Mixed adding subtraction problems A chocolate bar has 15 pieces. William eats 3 pieces and Amber eats 2 pieces. What fraction of the chocolate bar remains? multiply simple pairs of proper fractions, writing the answer in its simplest form, (e.g. ¼ × ½ = ⅛) Multiply fractions by an integer Multiply fractions by fraction Recognise that ¼ of 12, ¼ x 12 and 12 divided by 4 are equivalent Use cancellation to simplify the product of a fraction and an integer Eg if ⅕ x 15 = 3 then ⅖ x 15 = 2 x ⅕ x 15 = 2x3 = 6 Work out how many ½s in 15, how many ⅖s in 15, how many 2/5s in 1 etc. divide proper fractions by whole numbers (e.g. ⅓ ÷ 2 = ⅙) Divide fraction s by integer (1) Divide fractions by integer (2) Would prefer to share ½ of a pizza with 2 people or ¾ of a pizza with 4 people? Why? solve problems which require answers to be rounded to specified degrees of accuracy Children should be able to solve problems such as - Four friends win £48,623. The money is to be shared equally between them – how much will each person receive? 107 pupils and teachers need to be taken to the theatre. How many 15-seater minibuses will be required? How many boxes of 60 nails can be filled from 340 nails?	solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate Metric measures Calculate with metric measures Imperial measures Children should be able to draw a flow chart to help someone else convert between mm, cm, m and km. They should know the approximate equivalence between commonly used imperial units and metric units: 1 litre is approximately 2 pints (more accurately, 1 ¾ pints) 4.5 litres is approximately 1 gallon or 8 pint kilogram is approximately 2 lb (more accurately, 2.2 lb) 30 grams is approximately 1 oz They should be able to answer questions such as: approximately how many litres are there in 3 gallons? Give your answer to the nearest litre. convert between miles and kilometres Miles and kilometres Know that 8 km is approx. 5 miles Children should be able to use conversion graphs that show miles/kilometres. They should be able to use it to estimate a distance of 95 miles in kilometres. 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 metric measures This scale (not actual size) shows length measurements in centimetres and feet. Look at the scale. Estimate the number of centimetres that are equal to 2 ½ feet. Estimate the difference in centimetres between 50 cm and 1 foot.
Nrich links	1	1 2 3 4 5 6 7			
NCTEM conditional knowledge	Spot the mistake: -80,-40,10,50 What is wrong with this sequence of numbers? True or False? When I count backwards in 50s from 10 I will say -200 True or False? The temperature is -3. It gets 2 degrees warmer. The new temperature is -5 Do, then explain Show the value of the digit 6 in these numbers? 67787555 95467754 Explain how you know. Make up an example Create seven digit numbers where the digit sum is six and the tens of thousands digit is two. E.g. 4020000 What is the largest/smallest number? Do, then explain Find out the populations in five countries. Order the populations starting with the largest. Explain how you ordered the countries and their populations	Hard and easy questions Which questions are easy / hard? 213323 - 70 = 512893 + 37 = 8193.54 - 5.9 = Explain why you think the hard questions are hard? Missing symbols Write the missing signs (+ - x ÷) in this number sentence What else do you know? If you know this: 86.7 + 13.3 = 100 what other facts do you know? Convince me Three four digit numbers total 12435. What could they be? Convince me Making an estimate Circle the number that is the best estimate to 932.6 - 931.05 1.3 1.5 1.7 1.9 Always, sometimes, never Is it always, sometimes or never true that the sum of two consecutive triangular numbers is a square number? Always, sometimes, never? Is it always, sometimes or never true that dividing a whole number by a half makes the answer twice as big? Is it always, sometimes or never true that when you square an even number, the result is divisible by 4. Is it always, sometimes or never true that multiples of 7 are 1 more or 1 less than prime numbers?	Spot the mistake Identify and explain mistakes when counting in more complex fractional steps What do you notice? One thousandth of my money is 31p. How much do I have? What do you notice? 8/5 of 25 = 40 5/4 of 16 = 20 7/6 of 36 = 42 Can you write similar statements? Give an example of a fraction that is greater than 1.1 and less than 1.5. Now another example that no one will think of. Explain how you know. Another and another Write a unit fraction which has a value of less than 0.5? ... and another, ... and another, ... Ordering Which is larger, Explain how you know. Put the following amounts in order, starting with the largest. 23%, 5/8, 3/5, 0.8		Top Tips Put these amounts in order starting with the largest. Explain your thinking 100 cm3 1000000 mm3 What do you notice? 8 km = 5 miles Write down some more facts connecting kilometres and miles. Write more statements Chen, Megan and Sam have parcels. Megan's parcel weighs 1.2kg and Chen's parcel is 1500g and Sam's parcel is half the weight of Megan's parcel. Write down some other statements about the parcels. How much heavier is Megan's parcel than Chen's parcel?

Maths Curriculum Map – Year 6 (Spring)

Number		Geometry		Measure		Statistics	

	Week 1-2 Block 1	Weeks 3-4 Block 2	Weeks 5-6 Block 3	Week 7 - 8 Block 4	Week 9-10 Block 5	Week 11-12 Block 6
	Ratio	**Algebra**	**Decimals**	**Fractions, Decimals and Percentages**	**Area and Perimeter**	**Statistics**
KIRFs	**To know how to find fractions of amounts**			**To know common decimals, fractions and percentages equivalences**		
vocab	fractions, equivalence, thirds, quarters, denominator, numerator, times and divide, whole, part, unit fraction, non-unit fraction, factor, product	find ¾ of 34 how do you find 3/5 of 45 divide 24 by 4 and then this product by 3		To know how to convert between decimals and fractions for ½, ¼, ¾ and any number of tenths.	How many **tenths** is 0.8? How many **hundredths** is 0.12? Write 0.75 as a **fraction?** Write ¼ as a **decimal**?	
Declarative SK	• use number bonds to 1 and 10 to mentally subtract any pair of one-place or two-place decimal numbers using complementary addition [10 – 3.65 as 0.35 + 6] • use number facts and place value to perform mental subtraction of large numbers or decimal numbers with up to two places [467,900 – 3,005 or 4.63 – 1.02] • add and subtract positive and negative numbers [calculate rise in temperature or continue a sequence]			• identify common factors, common multiples and prime numbers and use factors in mental multiplication [326x6 is 652x3] and division [438÷6 is 219÷3] • use place value and number facts as mental strategies [40,00 x 6 = 240,000 or 0.03 x 6 = 0.18] • use tests for divisibility to aid mental calculations		
Learning End Points (White Rose)	• Use ratio language. • Ratio and fractions. • Introducing the ratio • symbol. • Calculating ratio. • Using scale factors. • Calculating scale factors. • Ratio and proportion problems.	• Find a rule – one step. • Find a rule – two step. • Use an algebraic rule. • Solve two step substitution. • Formulae. • Word problems. • Solve simple one step equations. • Find pairs of values. • Enumerate possibilities.	• Three decimal places. • Multiply by 10, 100 and 1,000. • Divide by 10, 100 and 1,000. • Multiply decimals by Fractions to decimals (1). • integers. • Divide decimals by integers. • Division to solve problems. • Decimals as fractions. • Fractions to decimals (2).	• Fractions to percentages. • Equivalent FDP. • Percentage of an amount • Percentage of a decrease. • amount (2). • Percentages – missing values. • Percentage increase and • order FDP.	• Shapes – same area. • Area and perimeter. • Area of a triangle (1). • Area of a triangle (2). • Area of a triangle (3). • Area of a parallelogram. • Volume – counting cubes. • Volume of a cuboid.	• Read and interpret line graphs. • Draw line graphs. • Use line graphs to solve problems. • Circles. • Read and interpret pie charts. • Pie charts with percentages. • Draw pie charts. • The mean.
Procedural NC know	Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts. Solve problems or can be found. involving similar shapes where the scale factor is known Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.	Use simple formulae. Generate and describe linear number sequences. Express missing number problems algebraically. Find pairs of e2numerate numbers that satisfy an equation with two unknowns. possibilities of combinations of two variables.	Identify the value of each digit in numbers given to 3 decimal places and multiply numbers by 10, 100 and 1,000 giving answers up to 3 decimal places. Multiply one-digit numbers methods in cases where with up to 2 decimal places by whole numbers. Use written division the answer has up to 2 decimal places. Solve problems which require answers to be rounded to specified degrees of accuracy.	Solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of equivalences percentages for comparison. Recall and use between simple fractions, decimals and percentages including in different contexts.	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 triangles. volume of shapes. Calculate the area of parallelograms and Calculate, estimate and compare volume of cubes and cuboids using standard units, including cm3, m3 and extending to other units (mm3, km3).	Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius. Interpret and construct pie charts and line graphs and use these to solve problems. Calculate the mean as an average.
Specific block Vocab	Ratio, proportion, scale, scale factor, proportionality.	Sequence, rule, term, algebra, expression, calculation, formula, substitute, generalise, operation, calculate, equation, inverse, solution.	Decimal place, tenth, hundredth, thousandth, decimal point, place value, digit, fraction, one decimal place, two decimal places.	decimal place, tenth, hundredth, thousandth, decimal point, place value, digit, fraction, per cent (%), percentage, one decimal place, two decimal places.	Volume, solid, capacity, calculate, estimate, cube, perpendicular, right angle, perimeter, area, formula, base, height, cubic centimetres, cubic meters.	Nets, 2D shapes, 3D shapes, interior angles quadrilateral, isosceles, scalene, right angled triangle, interior angles.

NCTEM STEM sentences	**The Big Ideas** A linear sequence of numbers is where the difference between the values of neighbouring terms is constant. The relationship can be generated in two ways: the sequence-generating rule can be recursive, i.e. one number in the sequence is generated from the preceding number (e.g. by adding 3 to the preceding number), or ordinal, i.e. the position of the number in the sequence generates the number (e.g. by multiplying the position by 3, and then subtracting 2). Sometimes sequence generating rules that seem different can generate the same sequence: the ordinal rule 'one more than each of the even numbers, starting with 2' generates the same sequence as the recursive rule 'start at 1 and add on 2, then another 2, then another 2, and so on'.	**The Big Ideas** A value is said to solve a symbol sentence (or an equation) if substituting the value into the sentence (equation) satisfies it, i.e. results in a true statement. For example, we can say that 4 solves the symbol sentence (equation) 9 – = + 1 (or 9 – x = x + 1) because it is a true statement that 9 – 4 = 4 + 1. We say that 4 satisfies the symbol sentence (equation) 9 – = + 1 (or 9 – x = x + 1).	**The Big Ideas** It is important to distinguish between situations with an additive change or a multiplicative change (which involves ratio). For example, if four children have six sandwiches to share and two more children join them, although two more children have been added, the number of sandwiches then needed for everyone to still get the same amount is calculated multiplicatively.	**The Big Ideas** Sequences can arise from naturally occurring patterns in mathematics and it is exciting for pupils to discover and generalise these. For example adding successive odd numbers will generate a sequence of square numbers. Letters or symbols are used to represent unknown numbers in a symbol sentence (i.e. an equation) or instruction. Usually, but not necessarily, in any one symbol sentence (equation) or instruction, different letters or different symbols represent different unknown numbers.	**The Big Ideas** It is important to distinguish between situations with an additive change or a multiplicative change (which involves ratio). For example, if four children have six sandwiches to share and two more children join them, although two more children have been added, the number of sandwiches then needed for everyone to still get the same amount is calculated multiplicatively.	**The Big Ideas** The questions 'What's the same?' and 'What's different?' can draw pupils' attention to variance and invariance. Shapes can be alike in essentially two different ways: congruent and similar. Congruent shapes are alike in all ways: they could occupy exactly the same space. Similar shapes share identical geometrical properties but can differ in size. All equilateral triangles are similar, but only identically sized ones are congruent. Not all isosceles triangles are similar. Angle properties are a mix of necessary conditions and conventions. It is a necessary condition that angles on a straight line combine to a complete half turn. That we measure the half turn as 180 is conventional.
Links	**Teaching for Mastery Year 6**	**Teaching for Mastery Year 6**	**Teaching for Mastery Year 6**	**Teaching for Mastery Year 6**	**Teaching for Mastery Year 6**	**Teaching for Mastery Year 6**
White Rose Documents	solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts Introducing the ratio symbol Calculating ratio Ratio and proportion problems Children recognise proportionality in context when relations between quantities are in the same ratio, such as recipes and similar shapes. Children consolidate their understanding of ratio when comparing quantities, sizes and scale drawings by solving a variety of problems. They might use notation such as *a:b* to record their work. This map has a scale of 1 cm to 6 km. The road from Ridlington to Carborough measured on the map is 6.6 cm long solve problems involving unequal sharing and grouping using knowledge of fractions and multiples Four rules with fractions Using ratio language Ratio and fractions Children solve problems involving unequal quantities, for example, 'for every egg you need 3 spoons of flour'. Relate fractions to multiplication and division (e.g. 6 ÷ 2 = ½ of 6 = 6 × ½), simplify fractions by cancelling common factors, find fractions of whole-number quantities and solve problems such as: What fraction is 18 of 12? What fraction is 500ml of 400ml? What is $^{14}/_{35}$ in its simplest form? What is two thirds of 66? What is three quarters of 500? A gardener plants tulip bulbs in a flower bed. For every 3 red bulbs, she plants 4 white bulbs. If she plants 60 white bulbs, how many red bulbs does she need?	find pairs of numbers that satisfy an equation with two unknowns Find a rule – one step Find a rule – two step Use an algebraic rule enumerate all possibilities of combinations of two variables Find pairs of values Enumerate possibilities Here are five number cards: A and B stand for two different whole numbers. The sum of all the numbers on all five cards is 30. What could be the values of A and B express missing number problems algebraically Word problems Non-statutory - solve equations One-step equations Two-step equations use simple formulae Substitution Formulae Use symbols to write a formula for the number of months m in y years. Write a formula for the cost of c chews at 4p each. The perimeter of a rectangle is 2 × (l + b), where l is the length and b is the breadth of the rectangle. What is the perimeter if l = 8 cm and b = 5 cm? Understand equivalent expressions (eg a + b = b + a) The number of bean sticks needed for a row which is m metres long is 2m + 1. How many bean sticks do you need for a row which is 60 metres long? Find missing numbers, lengths, co-ordinates and angles Maria bakes cakes and sells them in bags. She uses this formula to work out how much to charge for one bag of cakes. How much will a bag of 12 cakes cost [redacted] generate and describe linear number sequences generate and describe linear number sequences (with fractions) A number sequence is made from counters. There are 7 counters in the third number. How many counters in the 6th number? the 20th...?Write a formula for the number of counters in the nth number in the sequence. Write a formula for the nth term of this sequence: 3, 6, 9, 12, 15... Plot the points which show pairs of numbers with a sum of 9	identify the value of each digit to three decimal places Three decimal places Children should be able to identify the value of each digit in the number 17.036 multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places Multiply by 10, 100 and 1000 Divide by 10, 100 and 1000 Children should be able to identify the value of each digit in the number 17.036 and multiply and divide this by 10 and 100 and 1000 associate a fraction with division to calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. ⅜ Decimals as fractions Fractions to decimals (1) Fractions to decimals (2) Children should be able to find fractions of numbers and quantities: What fraction of £1 is 35p, ... 170p ? Write $^{23}/_{100}$ of 4 kilogrammes in grams What fraction of 1 litre is 413 ml? Convert a fraction to a decimal using known equivalent fractions: ¼ = 0.25 ⅖=0.4 Explain how much pizza each person would get if they divided 4 pizzas between 5 people, as a fraction and a decimal. Circle the two fractions that are equivalent to 0.6. $^{6}/_{10}$ $^{1}/_{60}$ $^{60}/_{100}$ $^{1}/_{6}$	solve problems involving the calculation of percentages (e.g. of measures) such as 15% of 360 and the use of percentages for comparison Percentage of an amount (1) Percentage of an amount (2) Percentage increase and decrease A class contains 12 boys and 18 girls. What percentage of the class are girls? What percentage are boys? 25% of the apples in a basket are red. The rest are green. There are 21 red apples. How many green apples are there? recall and use equivalences between simple fractions, decimals and percentages, including in different contexts Fractions to percentages Equivalent FDP Order FDP	recognise that shapes with the same areas can have different perimeters and vice versa Same areas Area and perimeter The perimeter of this square is 72 centimetres. The square is cut in half to make two identical rectangles What is the perimeter of one rectangle? Children should be able to calculate the perimeters of compound shapes that can be split into rectangles. What is the perimeter of this shape? calculate the area of parallelograms and triangles Area of a triangle (1) Area of a triangle (2) Area of a triangle (3) recognise when it is possible to use formulae for area and volume of shapes Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres and cubic metres, and extend to other units (eg mm³) Volume – counting cubes Volume of a cuboid The shaded square is surrounded by 8 identical trapeziums to make a bigger square. The larger square has a side length of 12cm. The shaded square has a side length of 6cm. What is the area of one of the trapeziums? This cube and cuboid have the same volume. What is the height of the cuboid?	interpret and construct pie charts and line graphs and use these to solve problems Read and interpret line graphs Draw line graphs Use line graphs to solve problems Read and interpret pie charts Pie charts with percentages Draw pie charts Class 6 did a survey of the number of trees in a country park. This pie chart shows their results. Estimate the fraction of trees in the survey that are oak trees. The children counted 60 ash trees. Use the pie chart to estimate the number of beech trees they counted. Children should be able to interpret and draw graphs relating two variables, arising from their own enquiry and in other subjects. They hould be able to interpret a graph connecting kilometres and miles This graph shows the number of people living in a town. How many people lived in the town in 1985? In which year was the number of people the same as in 1950? Find the year when the number of people first went below 20 000. calculate and interpret the mean as an average The mean From a simple database, children should be able to find the most common score (mode) as well as the mean score for each test. Children should be able to choose their own sets of data to match given criteria, e.g. find a set of five numbers that have a mean of 5 and a range of 7.
Nrich links		1 2 3 4 5 6	1 2	1		1 2
NCTEM conditional knowledge	Testing conditions A square has the perimeter of 12 cm. When 4 squares are put together, the perimeter of the new shape can be calculated. e.g. What arrangements will give the maximum perimeter? Always, sometimes, never? The area of a triangle is half the area of the rectangle that encloses it Other possibilities A cuboid has a volume between 200 and 250 cm cubed. Each edge is at least 4cm long. List four possibilities for the dimensions of the cuboid. The answer is .... 24 metres cubed, What is the question?	Field A is twice as long as field B but their widths are the same and are 7.6 metres. If the perimeter of the small field is 23m what is the perimeter of the entire shape containing both fields? If y stands for a number complete the table below. What is the largest value of y if the greatest number in the table was 163? Generalising Write a formula for the 10th, 100th and nth terms of the sequences below. 4, 8, 12, 16 and 0.4, 0.8, 1.2, 1.6...	Give an example of a fraction that is greater than 1.1 and less than 1.5. Now another example that no one will think of. Explain how you know. Another and another Write a unit fraction which has a value of less than 0.5? Ordering Put the following amounts in order, starting with 23%, 5/8, 3/5, 0.8	True or false? 25% of 23km is longer than 0.2 of 20km. difference of 1 2/... and another, ... and Convince me. Write down 2 fractions with a total of 3 4/5. ... Continue the pattern What do you notice? 1/3 ÷ 2 = 1/6, 1/6 ÷ 2 = 1/12, 1/12 ÷ 2 = 1/24 Give your top tips for dividing fractions. What else do you know? 88% of a sum of money = £242. Make up some other statements. Write real life problems for Undoing I think of a number and then reduce it by 15%. The number I end up with is 306. What was my original number? In a sale where everything is reduced by 15% I paid the following prices for three items. What was the original selling price? £255, £850, £4.25	Create a question Make up a set of five numbers with a mean of 2.7 Missing information The mean score in six test papers in a spelling test of 20 questions is 15. Five of the scores were 13 12 17 18 16 What was the missing score?	True or false? (looking at a pie chart) "More than twice the number of people say their favourite type of T.V. programme is soaps than any other" Is this true or false? Convince me. Make up your own 'true/false' statement about the pie chart. What's the same, what's different? Pupils identify similarities and differences between different representations and explain them to each other

Maths Curriculum Map – Year 6 (Summer)

Number		Geometry		Measure		Statistics	

	Week 1 - 3 Block 1	Week 4 Block 2	Week 5-12	
	Shape	**Position and Direction**	**Themed Projects, Consolidation and Problem Solving**	
KIRFs	**To know how to divide and multiply by 10, 100, 1000**		**To know how to find simple percentages of amounts**	
vocab	divide, multiply, tenths, thousands, column, digits, decimal point, hundreds, thousands, covert, shift, zero	What is 1234 divided by 10, 100, 1000? What columns will you use? What happens to the decimal point?	To know how to convert between decimals and fractions and percentages for ½, ¼, ¾ and any number of tenths.	How many **tenths** is 0.8? what percentage is ¾? find 10% of? Find 28% of? Write 0.75 as a **percentage?**
Declarative SK	• use doubling and halving to multiply and divide by 2, 4, 8, 5, 20, 50 and 25 [28 x 25 is ¼ of 28 x 100] • use rounding to support mental multiplication [34 x 19 is (34 x 20) – 34] • multiply and divide one and two-place decimal numbers up to and including 10 using place value and partitioning [3.6 x 4 is 12 + 2.4 / 2.4 ÷ 6 is (24 ÷ 6) ÷ 10]		• double and halve decimal numbers with up to two places using partitioning [36.73 x 2 is double 36 plus double 0.73 / half of 36.86 is half of 36 plus half of 86] • know and use equivalence between simple fractions, decimals and percentages, including in different contexts • recognise a given ratio and reduce it to its lowest terms	
Learning End Points (White Rose)	• Measure with a protractor. • Introduce angles. • Calculate angles. • Vertically opposite angles. • Angles in a triangle. • Angles in a triangle – special cases. • Angles in a triangle – missing angles. • Angles in special quadrilaterals. • Angles in regular polygons. • Draw shapes accurately. • Nets of 3D shapes.	• Coordinates in the first quadrant. • Coordinate in four quadrants. • Translations. • Reflections.	Themed projects, Consolidation and Problem Solving	
Procedural NC know	Draw 2-D shapes using given dimensions and angles. Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals and regular polygons. Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.	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.	Themed projects, Consolidation and Problem Solving	
Specific block	Mean, average, pie chart, segment, line graph, bar chart, percentage, fraction, data.			

NCTEM STEM sentences	The Big Ideas Variance and invariance are important ideas in mathematics, particularly in geometry. A set of quadrilaterals for example may vary in many ways in terms of area, length of sides and the size of individual angles. However there are a set of invariant properties which remain common to all quadrilaterals, namely they have four sides and their internal angles su m to 360o. Some of these properties emerge from naturally occurring constraints, for example the sum of the internal angles will always sum to 360 and they can do nothing else!	The Big Ideas The questions 'What's the same?' and 'What's different?' can draw pupils' attention to variance and invariance. Shapes can be alike in essentially two different ways: congruent and similar. Congruent shapes are alike in all ways: they could occupy exactly the same space. Similar shapes share identical geometrical properties but can differ in size. All equilateral triangles are similar, but only identically sized ones are congruent. Not all isosceles triangles are similar. Angle properties are a mix of necessary conditions and conventions. It is a necessary condition that angles on a straight line combine to a complete half turn. That we measure the half turn as 180 is conventional.	The Big Ideas Pie charts visually display relative proportions, for example, that the proportion of pupils at School A liking reading is greater than the proportion at School B.
Links	**Teaching for Mastery Year 6**	**Teaching for Mastery Year 6**	**Teaching for Mastery Year 6**
White Rose Documents	recognise, describe and build simple 3-D shapes, including making nets Nets of 3D shapes Children should be able to identify, visualise and describe properties of rectangles, triangles, regular polygons and 3-D solids; use knowledge of properties to draw 2-D shapes and identify and draw nets of 3-D shapes Children should be able to respond accurately to questions such as 'I am thinking of a 3D shape. It has a square base. It has four other faces which are triangles. What is the name of the 3D shape?' Which of these nets are of square based pyramids? How do you know? illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius Circles Children should know that: The circumference is the distance round the circle The radius is the distance from the centre to the circumference The diameter is 2 x radius draw 2-D shapes using given dimensions and angles Measure with a protractor Draw shapes accurately Children should be able to construct a triangle given two sides and the included angle recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles Calculate angles Vertically opposite angles There are nine equal angles around a point. What is the size of each angle?' 'There are a number of equal angles around a point. The size of each angle is 24°. How many equal angles are there compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons Angles in a triangle (1) Angles in a triangle (2) Angles in a triangle (3) Angles in quadrilaterals Angles in polygons Children should be able to make and draw shapes with increasing accuracy and knowledge of their properties. They should be able to carry out activities such as - Give me instructions to get me to draw a rhombus using my ruler and a protractor' 'On squared paper, use a ruler to draw a pentagon that has three right angles'	describe positions on the full coordinate grid (all four quadrants) The first quadrant Plotting coordinates Children should be able to draw and label rectangles, parallelograms and rhombuses, specified by co-ordinates in the four quadrants, predicting missing co-ordinates using the properties of Shapes The two shaded squares below are the same size. A is the point (17,8), B is the point (7, -2). What are the co-ordinates of point C draw and translate simple shapes on the coordinate plane, and reflect them in the axes Translation Here is a quadrilateral. Theshape is translated so that point A is now at point B. Complete the shape in its new position. Use a ruler. Draw and translate simple shapes on the coordinate plane, and reflect them in the axes Reflections Children should be able to draw a shape with corners at given vertices, and describe the properties of the shape. Can they create the same shape where all of the coordinates will be positive? Negative? Children should be able to sketch the reflection of a simple shape in two mirror lines at right angles and find the coordinates of selected points. Complete the diagram by reflecting the shape in the mirror line –	Themed projects, Consolidation and Problem Solving
Nrich links	1 2 3 4 5 6 7 8	1 2	
NCTEM conditional knowledge	What's the same, what's different about the nets of a triangular prism and a square based pyramid? Visualising Jess has 24 cubes which she builds to make a cuboid. Write the dimensions of cuboids that she could make. List all the possibilities. Always, sometimes, never Is it always, sometimes or never true that, in a polyhedron, the number of vertices plus the number of faces equals the number of edges? Other possibilities Not to scale The angle at the top of this isosceles triangle is 110 degrees. What are the other angles in the triangle? Convince me One angle at the point where the diagonals of a rectangle meet is 36 degrees. What could the other angles be?		Themed projects, Consolidation and Problem Solving