



Intent and design

What are we trying to achieve?

By promoting our school ethos of ‘Respect, Pride, Achieve,’ together with our Red Kite Values, our young people will have the character traits, knowledge and skills to make a positive impact on the world.

In maths, we want our pupils to be problem solvers and to accurately recall sticky knowledge that can be applied to real-world contexts. The children are encouraged to always take pride and achieve their personal best.

Intent

C: We promote and embed a positive Maths *culture*.

H: Maths is vital in everyday life. Through problem-solving children are encouraged to be resilient, and accept that struggle is often a necessary step in learning, promoting positive mental *health*.

A: We *aspire* for children to secure a deep and adaptable understanding of Maths which they can apply to different contexts.

I: We develop our children’s mathematical *identity* by providing the opportunity to develop conceptual understanding through range of practical, investigative and written work.

R: Children foster good *relationships* by talking about their Maths and working cooperatively to solve problems. They demonstrate respect for their peers and their ideas.

- The curriculum is based on the national curriculum intentions. The aim for maths is that pupils will become proud problem solvers and accurately and rapidly recall sticky knowledge that can be applied to real-world contexts, to help them achieve.

At Rushden Primary Academy, we use the Teaching for Mastery approach to ensure our curriculum ...

- gives the opportunity for every child to learn and enjoy maths.
- encourages children to reason, problem-solve and make connections to real-life contexts.
- allows children to work collaboratively to refine and improve their learning.
- uses the CPA approach (concrete, pictorial, abstract) to teaching mathematics.
- is built in small, logical steps to allow pupils of all ages to acquire a deep, secure and adaptable understanding of mathematical procedures.
- nurtures a positive attitude and builds confidence in mathematics so that all children can achieve
- develops procedural fluency and conceptual understanding.
- is taught together as a whole class and the focus is on depth - not acceleration - so that all children have a chance to embed learning.
- uses a ping-pong approach to teaching, allowing for questioning, short tasks, explanation, demonstration, and discussion, enabling pupils to think, reason and apply their knowledge to solve problems.

Vision and aims
for Maths in
our school



- Uses precise mathematical language to enable all pupils to communicate their reasoning and thinking effectively.
- allows us to quickly identify a pupil who may fail to grasp a concept and address gaps in understanding to prevent them from falling behind.

Outcomes for pupils in Maths

Children will have (from AIP):

- The majority of pupils, including disadvantaged (70%-84% of pupils), have achieved the expected standard for their age in Reading, writing and Maths by the end of the academic year.
- The gap between disadvantaged pupils and their peers has reduced by the end of the year
- Pupils with SEND will have made accelerated progress from their start points.
- An improved outcome for girls in most year groups *Specific gaps identified in Maths: outcomes for girls in most year groups)

Vision and aims for maths in our school:

Children will have/be able to:

- Foster reasoning and articulate problem-solving skills. They will learn how to analyse problems, make connections, and articulate their understanding using mathematical language. Through regular practice and exposure to a range of problem-solving tasks, students will become confident in explaining their mathematical thinking and reasoning.
- Promote collaborative learning and exploration of mathematical concepts. Collaborative tasks promote communication, peer learning, and the sharing of different perspectives. By working together, students can deepen their understanding through meaningful discussions and learn from each other's approaches.
- Connect mathematics to real-life contexts and applications.
- Develop automaticity in learning mathematical facts through regular practice and repetition. By developing automaticity in fundamental operations, such as addition, subtraction, multiplication, and division, students can solve problems more effectively and efficiently, freeing up cognitive resources for higher-level thinking.

By implementing this approach, we strive to provide students with a deep understanding of mathematics, the ability to explain their reasoning, the opportunity to work together, and a practical understanding of how mathematics is used in the world.

Assessment

At Rushden Primary Academy, teachers utilise both formative and summative assessments to gauge students' progress and understanding of mathematics. Formative assessments are conducted while children are actively engaged in their learning, allowing teachers to provide immediate feedback and support. These assessments help identify any misconceptions or areas where additional instruction is needed.

In addition to ongoing formative assessments, teachers administer summative assessments at the end of specific units or academic years. These assessments serve as a way to evaluate students' overall achievement and provide a comprehensive picture of their mathematical knowledge and skills. Some of the assessments used at Rushden Primary Academy include:

1. White Rose tests: These assessments align with the White Rose Maths scheme and are designed to assess students' understanding of specific mathematical concepts and skills.

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	<p>2. KS2 SATS: Key Stage 2 SATS (Standardised Assessment Tests) are national assessments administered at the end of Year 6. These tests cover a range of mathematics topics and provide standardised measures of students' attainment.</p> <p>3. Year 4 Multiplication Check: This is a national assessment administered in Year 4 to evaluate students' fluency in multiplication tables up to 12x12.</p> <p>4. PIXL papers: PIXL (Partners in Excellence) papers are assessments provided by the PIXL organisation. These papers help identify individual student's strengths and areas for improvement, providing targeted support and intervention.</p>
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<p>Key principles underpinning our curriculum.</p>	<p>Knowing more</p> <p>Remembering more</p>	<p>CLARITY OF PURPOSE To learn basic maths skills. Maths underpins the entire curriculum, and it is essential that children learn basic maths as it is used in everyday life</p> <p>Reception- NCETM, & white rose, early number sense KS1-2- white rose and planpanion KS1- number sense KS2- arithmetic created from PIXL gaps</p>	<p>PROGRESSION OF KEY CONCEPTS Appropriate pitch and expectations learning journeys</p>			
		<p>CONNECTIONS Maths is vital across the entire curriculum, particularly in DT, computing, and science with statistics (graphs and tables), measurements and geometry.</p> <p>Acquiring maths skills is important for everyday life for instance in regard to money and telling the time.</p> <p>At our school, we prioritise the integration of mathematics across the curriculum. We believe in the power of embedding mathematical concepts and skills into various subjects. By doing so, we ensure that students not only develop a strong foundation in mathematics but also understand its relevance and application in real-world contexts. Through this approach, we aim to nurture well-rounded learners who can confidently utilise mathematics in diverse areas of study.</p>	<p>Sticky words New maths words are introduced in every unit and are built on in subsequent years.</p> <p>See vocab progression document.</p>	<p>Skills being used and developed further within each year group.</p> <p>See small steps in LTP below</p> <p>Flashback 4- last lesson, last week, last term, last year and a fifth question linking to gaps – shape, clocks, roman numeral etc.</p> <p>PIXL/ SATS papers asks questions from the previous year group</p>	<p>Resource rich environment. Opportunities for children to use equipment.</p> <p>Manipulatives in classrooms. These will be stored in containers uniform across the school.</p> <p>Number formation strips 1-9 on the board and a big version on top of the maths wall.</p> <p>Working wall - sticky words, last week, this week, speech bubble, build it a3 board.</p>	<p>Use of assessment.</p> <p>Daily arithmetic/ number sense</p> <p>White rose end of block assessments</p> <p>Pixl Y3-6 Year 2 and 6 SATS tests</p> <p>X 2 weekly flashback 5 reactivating starters</p> <p>Mini assessments within intervention</p> <p>TT Rockstars baseline and checks each term</p> <p>Year 4 multiplication check</p>

Values	Our curriculum is underpinned by our British values, equalities, school ethos and the need to build cultural capital for all our pupils.
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<p>Implementation How do we organise learning?</p>



Components of Maths	<p>Lessons</p> <p>1 hour every day math lessons x 5 a week in KS2 and Year 2, x 4 a week in Year 1 and x 4 in EYFS (1-1.20)</p> <p>X5 a week arithmetic sessions between 15-30 minutes Y4-6 SATs/PIXL gaps for arithmetic YR-3 15 minute daily Number Sense arithmetic.</p> <p>Maths LI link to curriculum work.</p> <p>Roman numeral dates written in curriculum books from Y3-6.</p>	<p>Events</p> <p>Year 4 multiplication test Monday 5th June- Friday 26th June</p> <p>NSPCC Maths Day 3.2.22</p>	<p>Visits/visitors</p> <p>Parent/ teacher friends visitors- accountants, software/sound engineer, investment analyst</p> <p>Send form out to all parents who would like the business they work for to come in to tell children about maths careers.</p>	<p>Learning outside the classroom</p> <p>Maths lesson outside on the playground e.g. chalk place value grid.</p> <p>TT Rockstars homework at home and in the library at break time</p> <p>TT Rockstars certificates on Friday's assembly</p> <p>Deepening Understanding/ Atom homework at home every week</p> <p>Math's interventions</p>	<p>Environment</p> <p>Each classroom has a Maths working wall board at the front of the classroom.</p> <p>Wall labelled as 'maths.'</p> <p>'This week's' and 'Last week's' learning labels.</p> <p>The calculation policy is visible.</p> <p>Extension speech bubbles are visible with an 'extension' sign.</p> <p>Sticky vocabulary words are evident.</p> <p>Pictorial and concrete resources are encouraged to be used alongside abstract working out.</p> <p>Sentence stems are encouraged to be displayed.</p> <p>Maths resources will be kept in uniform containers in every class near or in front of the maths wall.</p> <p>0-9 digits formation strip displayed above the maths board.</p> <p>Cross curricular maths evidence on curriculum board e.g. through DT and science.</p>	<p>Ethos</p> <p>Children need to feel comfortable with being uncomfortable</p>
	<p>5-part lesson</p> <ol style="list-style-type: none"> 1. Reactivate: To begin a lesson, teachers reactivate students' prior knowledge through various strategies. This includes using flashback 4 questions from White Rose, gap analysis questions, build it/draw it/connect it/explain it questions, and verbal discussions with talk partners. These activities help students recall and connect previously learnt concepts and prepare them for the new lesson. 2. Teach: The teaching phase is designed to engage and challenge students, regardless of their abilities. The instruction is pitched at a level that encourages the more able students to deepen their understanding while providing support to others. The CPA (Concrete, Pictorial, Abstract) approach is utilised, where the teacher models questions and addresses any misconceptions. This phase involves a significant amount of discussion between the teacher and students, fostering a collaborative and interactive learning environment. Students are encouraged to communicate using full sentence stems and use appropriate mathematical vocabulary. They are prompted to compare and contrast concepts by answering questions such as "What's the same?" and "What's different?" 3. Guided: Throughout the teaching phase, students work with a talk partner to complete a similar-style question. This guided practice allows students to apply their understanding with support and guidance from their partners. 4. Independent: In the independent phase, students work individually on a variety of fluency, problem-solving, and reasoning questions. Additional challenges or extension questions are 					



available on the "extension" area of the maths working wall to provide further challenges for those who need them.

5. Reflect: The reflection stage encourages students to reflect on their learning within the lesson. Teachers review students' work to identify any students who may require further intervention or support. Any final misconceptions or areas of difficulty are addressed during this stage to ensure that students have a clear understanding before moving on.

<p>Key aspects to develop</p>	<p>Transferable knowledge and understanding:</p> <p>All curriculum areas, particularly science.</p> <p>Use subject knowledge learnt in math lessons in curriculum books and on MTP in green highlighter e.g. tables, graphs, statistics. This should be clearly labelled with the appropriate math's LI from AR grids and this can be used as evidence towards ARE. T</p>	<p>Subject specific knowledge</p> <p>High staff turnover means that new staff are coming without the teaching for mastery training that previous teachers have had.</p>	<p>Ensure teachers accurately assess pupils' current level of understanding upon return to school and use this to inform planning</p> <p>Use assessment (white rose end of unit assessment, flashback 4, PiXL tests, SATS tests, the previous year group's summer data) to identify gaps in Maths</p> <p>Internally monitor PiXL data and insight data looking at PiXL score.</p>	<p>Pupils who are not on track are identified and interventions are put in place</p> <p>Interventions are personalised on SMART targets and reviewed every 6 weeks</p> <p>Focus children are making progress.</p> <p>Teachers know how to use PiXL to inform planning, arithmetic and interventions</p> <p>Year 3 and 4 Tackling Tables access is low.</p>	<p>Ensure all teachers have adequate subject knowledge to enable them to plan, teach and assess effectively without wasting learning time.</p> <p>Staff audit of individual needs</p> <p>Mastering number training</p> <p>Planning support- Year 1 and Year 3</p> <p>Challenge pupils more.</p>	<p>Environment</p> <p>Maths display: Calculation policy Last week this week Extension label Speech bubble Speech bubble stickers Build it/ draw it/ connect it/ explain it Concrete manipulatives Pictorial drawings Vocabulary- sticky words</p> <p>Consistent storage of maths resources in every class</p> <p>Adequate amount of resources per class</p>
	<p>Inconsistent marking and feedback across the school</p> <p>Ensure pupils respond to purple marking</p> <p>Ensure teacher's mark work up to date and go back and mark additional questions and challenges completed by pupils.</p> <p>More evidence of G, V and I is needed in books.</p>	<p>Manipulatives are not routinely used.</p> <p>CPA twilight training given.</p> <p>Encourage 1 dojo post with use of concrete resources to enable parents to support at home.</p>	<p>Teachers lack understanding of what progression looks like in maths</p> <p>CPD completed with LTP maths plans shared for each strand.</p>	<p>Lack of consistent whole school timetable ensuring that arithmetic is taught daily</p> <p>Timetable needs to be looked at by SLT.</p> <p>Monitor arithmetic happening when it is stated on the timetable</p>	<p>Ensure the planning for maths is clear and is appropriate for individual classes and encompass manipulatives.</p> <p>Revamp of planning to include CPA, for those that need it.</p> <p>More training needed so staff know how and when to use sentence stems.</p>	<p>Ineffective use of additional adults</p> <p>TA plan implemented to ensure they are well informed about learning and instructions. TAs need CPD on how to feedback on the learning as its currently behaviour orientated.</p> <p>TA training –more needed during Fri assembly.</p>



Big Picture for Maths



					<p>Monitor LTP, MTP and weekly plans.</p> <p>TA's planned in.</p> <p>Wide range of maths resources evident on planning other than White Rose on its own.</p> <p>CPD given on how to plan for a mastery maths lesson that includes the CPA approach.</p> <p>MTP changed to include arithmetic gaps and first two weeks after Christmas were spend teaching previous year group PIXL</p>	
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Contexts	<p>Contexts for Learning – Project themes – Big Questions - Sticky Words <i>Authentic purposes and contexts for learning: Berger 2006</i> Starting with the end in mind!</p>



Long Term Plan - Year Group Overview for Maths

Year	Autumn Term		Spring Term		Summer Term	
Reception (White Rose numerical) patterns	<p>Getting to know you 2w (baseline) opportunities for settling in/class routines 3w</p> <p>Match, sort and compare! 3w Number: Match and sort Compare amounts</p> <p>Measure, Shape and Spatial thinking: Compare size, mass and Capacity Exploring and creating patterns</p>	<p>It's me 1,2,3! 3w Number: Find, subitise and represent 1,2 &,3 1 more and 1 less Comparing 1,2, & 3 Composition of 1,2, & 3</p> <p>Measure, Shape and Spatial thinking: Circles and Triangles- identify and compare Positional Language</p> <p>Light and Dark 3w Number: Representing and subitising numbers to 5 One more and less Composition of 1-5</p> <p>Measure, Shape and Spatial thinking: Identify, name and combine shapes with 4 sides</p>	<p>Alive in 5! 3w Number: Introducing zero Comparing numbers to 5 Composition of 4&5 1 more and 1 less</p> <p>Measure, Shape and Spatial thinking: Compare Mass Compare Capacity</p> <p>Growing 6,7,8 3w Number: 6,7 & 8 1 more and 1 less Combing 2 amounts Making pairs Doubles to 8 – find and make a double</p> <p>Measure, Shape and Spatial thinking: Length & Height Time</p>	<p>Building 9 and 10 3w Number: Counting and representing numbers to 9 & 10 Comparing numbers to 10 Bonds to 10 Doubles to 10 Odd and even</p> <p>Measure, Shape and Spatial thinking: 2D and 3D shapes Spatial Awareness Patterns</p> <p>Consolidation – based on assessments</p>	<p>To 20 and beyond 3w Number: Building numbers beyond 10 Counting patterns beyond 10 Verbal counting beyond 20</p> <p>First, then, now 3w Number: Adding more Taking away</p> <p>Measure, Shape and Spatial thinking: Spatial reasoning (1) Match, rotate, manipulate Compose and decompose shape Copy 2D shapes Find 2D shapes within 3D shapes</p>	<p>Find my pattern 3w Number: Doubling Sharing & Grouping Even & Odd</p> <p>Measure, Shape and Spatial thinking: Spatial reasoning (3) Visualise and Build Identify repeating patterns Create pattern rules Describe positions</p> <p>On the move 3w Number: Deepening understanding Patterns and relationships</p> <p>Measure, Shape and Spatial thinking: Spatial reasoning (4) Mapping Patterns and relationships</p> <p>Consolidation</p>
1	<p>Number: Place Value (within 10) 5w Number: Addition and Subtraction (within 10) 2w</p>	<p>Number: Addition and Subtraction (within 10) 4w Geometry: Shape 2w Consolidation</p>	<p>PiXL – <i>based on an analysis, learning reflects the areas that need to be targeted and taught</i> Place value (within 20) 3w Addition and Subtraction (within 20) 3w</p>	<p>Number: Place Value (within 50) 2w Measurement: Length and Height 2w Measurement: Mass and volume 2w</p>	<p>Number: Multiplication and Division 3w Number: Fractions 2w Geometry: Position and Direction 1w</p>	<p>Number: Place Value (within 100) 2w Measurement: Money 1w Measurement: Time 2w Consolidation: 1w</p>
2	<p>Number: Place Value 4w Number: Addition and Subtraction 3w</p>	<p>Addition & Subtraction Geometry: Shape 3w</p>	<p>PiXL – <i>based on an analysis, learning reflects the areas that need to be targeted and taught</i> Measurement: Money 2w</p>	<p>Number: Multiplication and division Measurement: Length and Height 2w</p>	<p>PiXL – <i>based on an analysis, learning reflects the areas that need to be targeted and taught</i> 2w Number: Fractions 3w</p>	<p>Measurement: Time 2w Statistics 2w Geometry: Position and Direction 2w Consolidation</p>



			Number: Multiplication and division 4 weeks	Measurement: Mass, Capacity and Temperature 2w	Measurement: Time 1w	
3	Number: Place Value 3w Number: Addition and Subtraction 3w	Number: Addition and Subtraction 3w Number: Multiplication and Division 4w	PiXL – <i>based on an analysis, learning reflects the areas that need to be targeted and taught</i> 2w Number: Multiplication and Division 3w Measurement: Length and Perimeter 1w	Measurement: Length and Perimeter 1w Number: Fractions 2w Measurement: Mass and Capacity 2w	Measurement: Mass and Capacity 2w Number: Fractions 1w Measurement: Money 1w Measurement: Time 2w	Measurement: Time continued Geometry: Properties of Shape 1w Statistics Consolidation 1 w
4	Number: Place Value 4w Number: Addition and Subtraction 3w	Number: Multiplication and Division 3w Measurement: Area 1w Consolidation	PiXL – <i>based on an analysis, learning reflects the areas that need to be targeted and taught</i> 1w Number: Multiplication and Division Measurement: Length and Perimeter 2w Number: Fractions 2w	PiXL – <i>based on an analysis, learning reflects the areas that need to be targeted and taught</i> 1w Number: Fractions 2w Number: Decimals 2w	PiXL – <i>based on an analysis, learning reflects the areas that need to be targeted and taught</i> 1w Number: Decimals 3w Measurement: Money 2w	Measurement: Time 2w Consolidation Geometry: Shape 2w Statistics 1w Geometry: Position and Direction 2w
5	Number: Place value Number: Addition and subtraction Number: Multiplication and division	Number: Multiplication and division continued Number: Fractions	PiXL – <i>based on an analysis, learning reflects the areas that need to be targeted and taught</i> Number: Multiplication and Division Number: Fractions	PiXL – <i>based on an analysis, learning reflects the areas that need to be targeted and taught</i> Number: Decimal and Percentages Measurement: Perimeter and Area Statistics	Geometry: Properties of Shape – Angles 2w Geometry: Position and direction Number: Decimals	Number: Negative numbers Measurement: Converting measurement/ units/ time Measurement: Volume
6	Number: Place Value MOCK SATS 1w Number: Addition/ subtraction and multiplication/ division Converting Units	Number: Fractions MOCK SATS 1w Number: Decimals Measurement: Area, perimeter, and volume	PiXL – <i>based on an analysis, learning reflects the areas that need to be targeted and taught</i> Number: Fractions Decimals/percentages Statistics Geometry: Position and Direction MOCK SATS 1w Number: Ratio and proportion	Geometry: Shape MOCK SATS 1w Number: Algebra	SATs and Revision	Investigations Statistics

Big Picture for Maths



COUNTING						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Subitise (recognise quantities without counting) up to 5. Counting to 1, 2, 3 Counting to 4 Counting to 5	count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number			count backwards through zero to include negative numbers	interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero	use negative numbers in context, and calculate intervals across zero
Have deep understanding of number to 10, including the composition of each number (Number to 10 and within 10) Verbally count beyond 20, recognising the pattern of the counting system.	count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward	count from 0 in multiples of 4, 8, 50 and 100;	count in multiples of 6, 7, 9, 25 and 1000	count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000	
	given a number, identify one more and one less		find 10 or 100 more or less than a given number	find 1000 more or less than a given number		
COMPARING NUMBERS						
Compare quantities	use the language of: equal to, more than,	compare and order numbers from 0 up to	compare and order numbers up to 1000	order and compare numbers beyond 1000	read, write, order and compare	

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up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity. Subitize up to 5 without counting	less than (fewer), most, least	100; use $<$, $>$ and $=$ signs		<i>compare numbers with the same number of decimal places up to two decimal places</i> (copied from Fractions)	numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)
IDENTIFYING, REPRESENTING AND ESTIMATING NUMBERS						
Link the number symbol (numeral) with its cardinal number value Subitise (recognising quantities without counting) up to 5	identify and represent numbers using objects and pictorial representations including the number line	identify, represent and estimate numbers using different representations, including the number line	identify, represent and estimate numbers using different representations	identify, represent and estimate numbers using different representations		
READING AND WRITING NUMBERS (including Roman Numerals)						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Link the number symbol (numeral) with its cardinal number value.	read and write numbers from 1 to 20 in numerals and words.	read and write numbers to at least 100 in numerals and in words	read and write numbers up to 1000 in numerals and in words		read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit

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					(appears also in Comparing Numbers)	(appears also in Understanding Place Value)
			<i>tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks</i> (copied from Measurement)	read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.	read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	
UNDERSTANDING PLACE VALUE						
Understand the 'one more than/one less than' relationship between consecutive numbers Explore the composition of numbers to 10. Have a deep understanding of numbers to 10, including the composition of each number		recognise the place value of each digit in a two-digit number (tens, ones)	recognise the place value of each digit in a three-digit number (hundreds, tens, ones)	recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers) <i>recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents</i> (copied from Fractions)	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)
				<i>find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of</i>		<i>identify the value of each digit to three decimal places and</i>

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				<i>the digits in the answer as units, tenths and hundredths (copied from Fractions)</i>		<i>multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places (copied from Fractions)</i>
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ROUNDING						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				round any number to the nearest 10, 100 or 1 000	round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000	round any whole number to a required degree of accuracy
				<i>round decimals with one decimal place to the nearest whole number (copied from Fractions)</i>	<i>round decimals with two decimal places to the nearest whole number and to one decimal place (copied from Fractions)</i>	<i>solve problems which require answers to be rounded to specified degrees of accuracy (copied from Fractions)</i>
PROBLEM SOLVING						
		use place value and number facts to solve problems	solve number problems and practical problems involving these ideas.	solve number and practical problems that involve all of the above and with increasingly large positive numbers	solve number problems and practical problems that involve all of the above	solve number and practical problems that involve all of the above
ADDITION AND SUBTRACTION NUMBER BONDS						

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Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Automatically recall number bonds up to 5 and some to 10 (Introducing the part-whole model). Counting 10 1-3, counting to 4, counting to 5, counting to 6-8, counting to 9-10.</p> <p>Compare quantities up to 10 in different contexts recognizing when one quantity is greater/less than or the same as another (one more/one less)</p> <p>Explore the composition of numbers to 10.</p> <p>Number bonds to 10 (part-whole model to 10) -subitise -automatically recall -composition to 10</p> <p>Number bonds to 20 - Verbally count beyond 20</p>	<p>represent and use number bonds and related subtraction facts within 20</p>	<p>recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100</p>				
MENTAL CALCULATION						
<p>Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10,</p>	<p>add and subtract one-digit and two-digit numbers to 20, including zero</p>	<p>add and subtract numbers using concrete objects, pictorial representations, and mentally, including:</p> <ul style="list-style-type: none"> * a two-digit number and ones * a two-digit number and tens 	<p>add and subtract numbers mentally, including:</p> <ul style="list-style-type: none"> * a three-digit number and ones * a three-digit number and tens 		<p>add and subtract numbers mentally with increasingly large numbers</p>	<p>perform mental calculations, including with mixed operations and large numbers</p>

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including double facts. Addition to 10 Counting on and back -composition to 10 Subtraction		<ul style="list-style-type: none"> * two two-digit numbers * adding three one-digit numbers 	<ul style="list-style-type: none"> * a three-digit number and hundreds 			
	read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Written Methods)	show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot				use their knowledge of the order of operations to carry out calculations involving the four operations

WRITTEN METHODS						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Mental Calculation)		add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	

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INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS

INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS						
		recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	estimate the answer to a calculation and use inverse operations to check answers	estimate and use inverse operations to check answers to a calculation	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

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PROBLEM SOLVING						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly	solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$	<p>solve problems with addition and subtraction:</p> <ul style="list-style-type: none"> * using concrete objects and pictorial representations, including those involving numbers, quantities and measures * applying their increasing knowledge of mental and written methods 	solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
		<i>solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change (copied from Measurement)</i>				Solve problems involving addition, subtraction, multiplication and division

MULTIPLICATION & DIVISION FACTS						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.	count in multiples of twos, fives and tens (copied from Number and Place Value)	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward (copied from Number and Place Value)	count from 0 in multiples of 4, 8, 50 and 100 (copied from Number and Place Value)	count in multiples of 6, 7, 9, 25 and 1000 (copied from Number and Place Value)	count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 (copied from Number and Place Value)	

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		recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	recall multiplication and division facts for multiplication tables up to 12×12		
MENTAL CALCULATION						
			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 (appears also in Written Methods)	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 and divide numbers mentally drawing upon known facts	perform mental calculations, including with mixed operations and large numbers
		show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot		recognise and use factor pairs and commutativity in mental calculations (appears also in Properties of Numbers)	multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	<i>associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)</i> (copied from Fractions)
WRITTEN CALCULATION						

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Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs	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 (appears also in Mental Methods)	multiply two-digit and three-digit numbers by a one-digit number using formal written layout	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 multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
					divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context	divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context

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						use written division methods in cases where the answer has up to two decimal places (copied from Fractions (including decimals))
PROPERTIES OF NUMBERS: MULTIPLES, FACTORS, PRIMES, SQUARE AND CUBE NUMBERS						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				recognise and use factor pairs and commutativity in mental calculations (repeated)	identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.	identify common factors, common multiples and prime numbers
					know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers	<i>use common factors to simplify fractions; use common multiples to express fractions in the same denomination (copied from Fractions)</i>
					establish whether a number up to 100 is prime and recall prime numbers up to 19	
					recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)	<i>calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm³) and cubic metres (m³), and extending to other units such as mm³ and km³ (copied from Measures)</i>

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ORDER OF OPERATIONS						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
						use their knowledge of the order of operations to carry out calculations involving the four operations
INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS						
			<i>estimate the answer to a calculation and use inverse operations to check answers (copied from Addition and Subtraction)</i>	<i>estimate and use inverse operations to check answers to a calculation (copied from Addition and Subtraction)</i>		use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy

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PROBLEM SOLVING						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	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	solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	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	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	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
					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	<i>solve problems involving similar shapes where the scale factor is known or can be found (copied from Ratio and Proportion)</i>

FRACTIONS

COUNTING IN FRACTIONAL STEPS

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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		<i>Pupils should count in fractions up to 10, starting from any number and using the 1/2 and 2/4 equivalence on the number line (Non Statutory Guidance)</i>	count up and down in tenths	count up and down in hundredths		
RECOGNISING FRACTIONS						
	recognise, find and name a half as one of two equal parts of an object, shape or quantity	recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity	recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators	recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (appears also in Equivalence)	
			recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10.			
	recognise, find and name a quarter as one of four equal parts of an object, shape or quantity		recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators			
COMPARING FRACTIONS						
			compare and order unit fractions, and fractions with the same denominators		compare and order fractions whose denominators are all multiples of the same number	compare and order fractions, including fractions >1

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COMPARING DECIMALS						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				compare numbers with the same number of decimal places up to two decimal places	read, write, order and compare numbers with up to three decimal places	identify the value of each digit in numbers given to three decimal places
ROUNDING INCLUDING DECIMALS						
				round decimals with one decimal place to the nearest whole number	round decimals with two decimal places to the nearest whole number and to one decimal place	solve problems which require answers to be rounded to specified degrees of accuracy
EQUIVALENCE (INCLUDING FRACTIONS, DECIMALS AND PERCENTAGES)						
		write simple fractions e.g. $\frac{1}{2}$ of $6 = 3$ and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.	recognise and show, using diagrams, equivalent fractions with small denominators	recognise and show, using diagrams, families of common equivalent fractions	identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	use common factors to simplify fractions; use common multiples to express fractions in the same denomination
				recognise and write decimal equivalents of any number of tenths or hundredths	read and write decimal numbers as fractions (e.g. $0.71 = \frac{71}{100}$)	associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)
					recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	
				recognise and write decimal equivalents to $\frac{1}{4}$; $\frac{1}{2}$; $\frac{3}{4}$	recognise the per cent symbol (%) and understand that per cent relates to "number of parts per hundred", and write percentages as a fraction with denominator 100 as a decimal fraction.	recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

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ADDITION AND SUBTRACTION OF FRACTIONS						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			add and subtract fractions with the same denominator within one whole (e.g. $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$)	add and subtract fractions with the same denominator	add and subtract fractions with the same denominator and multiples of the same number	add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
					recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$)	
MULTIPLICATION AND DIVISION OF FRACTIONS						
					multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$)
						multiply one-digit numbers with up to two decimal places by whole numbers
						divide proper fractions by whole numbers (e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$)

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MULTIPLICATION AND DIVISION OF DECIMALS						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
						multiply one-digit numbers with up to two decimal places by whole numbers
				find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths		multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
						identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
						associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)
						use written division methods in cases where the answer

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						has up to two decimal places
PROBLEM SOLVING						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			solve problems that involve all of the above	solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number	solve problems involving numbers up to three decimal places	
				solve simple measure and money problems involving fractions and decimals to two decimal places.	solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those with a denominator of a multiple of 10 or 25.	

Ratio and proportion

Statements only appear in Year 6 but should be connected to previous learning, particularly fractions and multiplication and division

					Year 6
					solve problems involving the relative sizes of two quantities where missing values can be found by

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					using integer multiplication and division facts
					solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison
					solve problems involving similar shapes where the scale factor is known or can be found
					solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

ALGEBRA						
EQUATIONS						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	<i>solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$</i>	<i>recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems.</i> (copied from Addition and Subtraction)	<i>solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.</i> (copied from Addition and Subtraction)		<i>use the properties of rectangles to deduce related facts and find missing lengths and angles</i> (copied from Geometry: Properties of Shapes)	<i>express missing number problems algebraically</i>

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	(copied from Addition and Subtraction)		<i>solve problems, including missing number problems, involving multiplication and division, including integer scaling</i> (copied from Multiplication and Division)			
		<i>recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100</i> (copied from Addition and Subtraction)				find pairs of numbers that satisfy number sentences involving two unknowns
	<i>represent and use number bonds and related subtraction facts within 20</i> (copied from Addition and Subtraction)					enumerate all possibilities of combinations of two variables

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MEASUREMENT						
COMPARING AND ESTIMATING						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity (link to length, height, distance and weight)	compare, describe and solve practical problems for: <ul style="list-style-type: none"> * lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half] * mass/weight [e.g. heavy/light, heavier than, lighter than] * capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter] * time [e.g. quicker, slower, earlier, later] 	compare and order lengths, mass, volume/capacity and record the results using $>$, $<$ and $=$		estimate, compare and calculate different measures, including money in pounds and pence (also included in Measuring)	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)	calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3), and extending to other units such as mm^3 and km^3 .
					estimate volume (e.g. using 1 cm^3 blocks to build cubes and cuboids) and capacity (e.g. using water)	
	sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]	compare and sequence intervals of time	compare durations of events, for example to calculate the time taken by particular events or tasks			

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			estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight (appears also in Telling the Time)			
MEASURING and CALCULATING						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Volume and capacity- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.	measure and begin to record the following: * lengths and heights * mass/weight * capacity and volume * time (hours, minutes, seconds)	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	measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)	estimate, compare and calculate different measures , including money in pounds and pence (appears also in Comparing)	use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling.	solve problems involving the calculation and conversion of units of measure , using decimal notation up to three decimal places where appropriate (appears also in Converting)
			measure the perimeter of simple 2-D shapes	measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres	measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres	recognise that shapes with the same areas can have different perimeters and vice versa

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MEASURING and CALCULATING						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	recognise and know the value of different denominations of coins and notes	recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value	add and subtract amounts of money to give change, using both £ and p in practical contexts			
		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				
				find the area of rectilinear shapes by counting squares	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 <i>recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)</i> (copied from Multiplication and Division)	calculate the area of parallelograms and triangles
						calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm ³) and cubic metres (m ³), and extending to other units [e.g. mm ³ and km ³].
						recognise when it is possible to use formulae for area and volume of shapes

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TELLING THE TIME						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Begin to describe a sequence of events, real or fictional, using words, such as 'first,' 'then' (optional)	tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.	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.	tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks	read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting)		
	recognise and use language relating to dates, including days of the week, weeks, months and years	know the number of minutes in an hour and the number of hours in a day. (appears also in Converting)	estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight (appears also in Comparing and Estimating)			
				solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Converting)	solve problems involving converting between units of time	

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CONVERTING						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		know the number of minutes in an hour and the number of hours in a day. (appears also in Telling the Time)	know the number of seconds in a minute and the number of days in each month, year and leap year	convert between different units of measure (e.g. kilometre to metre; hour to minute)	convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)	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
				read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting)	solve problems involving converting between units of time	solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate (appears also in Measuring and Calculating)

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				<p>solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Telling the Time)</p>	<p>understand and use equivalences between metric units and common imperial units such as inches, pounds and pints</p>	<p>convert between miles and kilometres</p>
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FORMULAE						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				<p><i>Perimeter can be expressed algebraically as $2(a + b)$ where a and b are the dimensions in the same unit. (Copied from NSG measurement)</i></p>		<p>use simple formulae</p>
						<p><i>recognise when it is possible to use formulae for area and volume of shapes (copied from Measurement)</i></p>
SEQUENCES						
	<p><i>sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening (copied from Measurement)</i></p>	<p><i>compare and sequence intervals of time (copied from Measurement)</i></p>				<p>generate and describe linear number sequences</p>
		<p><i>order and arrange combinations of mathematical objects in patterns (copied from Geometry: position and direction)</i></p>				

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GEOMETRY						
IDENTIFYING SHAPES AND THEIR PROPERTIES						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Name some common shapes	recognise and name common 2-D and 3-D shapes, including: * 2-D shapes [e.g. rectangles (including squares), circles and triangles]	identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line		identify lines of symmetry in 2-D shapes presented in different orientations	identify 3-D shapes, including cubes and other cuboids, from 2-D representations	recognise, describe and build simple 3-D shapes, including making nets (appears also in Drawing and Constructing)
See 2D shapes on the flat surface of 3D shapes – compose and decompose shapes so children recognize a shape can have other shapes within it (Development Matters statement)	* 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres].	identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces				illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
Explore similarities and differences between 3D shapes		identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]				
DRAWING AND CONSTRUCTING						

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Explore how shapes can be combined to make patterns or new shapes.			draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them	complete a simple symmetric figure with respect to a specific line of symmetry	draw given angles, and measure them in degrees ($^{\circ}$)	draw 2-D shapes using given dimensions and angles
						recognise, describe and build simple 3-D shapes, including making nets (appears also in Identifying Shapes and Their Properties)
COMPARING AND CLASSIFYING						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Compare 2D shapes, saying what is the same, what is different		compare and sort common 2-D and 3-D shapes and everyday objects		compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes	use the properties of rectangles to deduce related facts and find missing lengths and angles	compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
Sort shapes according to what they notice					distinguish between regular and irregular polygons based on reasoning about equal sides and angles	
ANGLES						

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			recognise angles as a property of shape or a description of a turn		know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles	
			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 acute and obtuse angles and compare and order angles up to two right angles by size	identify: * angles at a point and one whole turn (total 360°) * angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°) * other multiples of 90°	recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
			identify horizontal and vertical lines and pairs of perpendicular and parallel lines			

GEOMETRY						
POSITION, DIRECTION AND MOVEMENT						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Begin to use positional language to describe how items are in relation to other items.	describe position, direction and movement, including half, quarter and three-quarter turns.	use mathematical vocabulary to describe position, direction and movement including movement in a straight line and		describe positions on a 2-D grid as coordinates in the first quadrant	identify, describe and represent the position of a shape following a reflection or translation, using the appropriate	describe positions on the full coordinate grid (all four quadrants)

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Select, rotate and manipulate shapes in order to develop spatial reasoning skills (Development Matters statement)		distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)		describe movements between positions as translations of a given unit to the left/right and up/down	language, and know that the shape has not changed	draw and translate simple shapes on the coordinate plane, and reflect them in the axes.
				plot specified points and draw sides to complete a given polygon		
PATTERN						
Continue, copy, and create repeating patterns (Development Matters statement)		order and arrange combinations of mathematical objects in patterns and sequences				

STATISTICS						
INTERPRETING, CONSTRUCTING AND PRESENTING DATA						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		interpret and construct simple pictograms, tally charts, block diagrams and simple tables	interpret and present data using bar charts, pictograms and tables	interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	complete, read and interpret information in tables, including timetables	interpret and construct pie charts and line graphs and use these to solve problems

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		ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity				
		ask and answer questions about totalling and comparing categorical data				
SOLVING PROBLEMS						
			solve one-step and two-step questions [e.g. 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.	solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.	solve comparison, sum and difference problems using information presented in a line graph	calculate and interpret the mean as an average

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Addition and subtraction

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<p>How to plan for progression:</p>	<p style="text-align: center;">Medium Term Planning:</p> <p>Learning challenge from the National Curriculum.</p> <p>Pre-learning assessment from previous formative and summative assessments (flashback 4, lesson plan notes, interventions, PIXL, SATS gaps from this year and previous years etc.)</p> <p>Identify subject specific vocabulary for each topic.</p> <p>Five part Rosenshein lesson approach needs to be adopted.</p> <p>Identify prior learning (speaking to previous teachings, checking against NC from previous years)</p> <p>Identify misconceptions for the topic. This should feed into planning and interventions</p> <p>Identify other learning opportunities – can this learning be transferred into other subject’s areas? E.g. science, DT, art.</p> <p>Teach topic using hands on practical activities for children- CPA approach. Manipulatives should be organised and stored nearby.</p> <p>Post-learning assessment- white rose end of topic assessments, SATs and PIXL papers.</p> <p>Assess progress of topic – Did children meet the learning objectives? Did children make progress from their pre question to their post question?</p>
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<p>High Impact Teaching Strategies</p>	<p>Clarity of objectives</p>	<p>Modelling explicit teaching</p> <p>CPA approach</p>	<p>Questioning</p>	<p>Practice - multiple exposures</p> <p>Flashback 4</p>	<p>Lesson design - teaching sequences</p> <p>Very dependent on each individual class’s gaps.</p>	<p>Personalised feedback</p>	<p>Collaboration</p> <p>Guided with talk partner, whole table and whole class.</p>	<p>Summarising learning and vocabulary</p> <p>Flashback 4</p>	<p>Challenge for all - low threshold, high ceiling</p> <p>Extension labels on the wall</p>	<p>Metacognition: and growth mindset</p>
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Impact
How well are we doing? Are we making a difference? How do we know?

Big Picture for Maths



Work sample analysis	What do our books show?
Lesson observations	What is the quality of teaching, learning and use of assessment in lessons? Are teaching meeting 'working scientifically' in lessons?
Planning scrutiny	What does our planning show?
Surveys	What do teacher audits say about this subject?
Interviews	What do the children say about their learning in this subject? What do the staff say about teaching this subject?
Standards	What do books/lesson observations/planning/interviews/learning environments tell us?
Coaching and Mentoring	What is the impact of coaching and mentoring? Support for colleagues in this subject?
Training	What is the impact of the training undertaken?
Learning Environment	How does the learning environment support learning in this subject area?

To secure	High standards of achievement Attainment and Progress	Excellent behaviour and attendance	Independent thinkers and learners	Confident learners
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How do we include/support children with SEND in ?????	<p>Low ceiling - high threshold activities and questions. Adult support for 1:1's – when asked to work in a small group, a child with ASD may find this problematic. Adult support is there to repeat key instructions/ideas. Diagrams and pictures for visual learners are useful in ?????, particularly when looking at new concepts. Hands-on activities to help with understanding. Sheets with structured activities to help with organisation – use of task plans and checklists for tasks. Recap of previous learning at the start of each lesson to help children remember. Allow additional time for tasks if needed. Use of templates if needed. Scribing in books/on sheets if a child struggles with written tasks. Bsquared has been purchased by the SENDCO for keep up sessions for those that are OYG level. Key vocabulary provided on working walls.</p>
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Big Picture for Maths



ICT – computers/iPads/interactive boards to help with research, exploring ideas, present work.
Alternative ways of recording – voice recording, video recording on iPads, photos of hands-on tasks.
Use of pupil responses.
Key vocabulary sent home – on overviews. Key vocabulary sent home and turned into matching games – matching definitions to words.