

Maths Recovery Curriculum

Autumn Term 2020

Medium Term Plan

Year 5/6

This learning schedule is based on the Hampshire Mathematics Scheme of Learning and is designed to take account of the national school closures between March 2020 and July 2020. Learners will begin a new academic year in need of catch-up and consolidation, together with some new learning from the previous academic year that has been missed. This document focusses on the core skills , knowledge and understanding that an ‘on-track’ learner would be expected to bring to the next stage of their learning and acknowledges that, for many, the habits of learning and the facility to recall previously embedded knowledge will need attention. For this reason, the first elements of this Autumn Term plan address the end of year objectives from the previous year. As the term progresses, the plan seeks to integrate expected prior learning, previously assumed and now no longer can be, into the standard units from the original scheme. In this way, the aim is to build on what is known and recalled in a moderately accelerated way to help learners get back on track for the end of the 20/21 academic year.

Teachers will need to adapt this schedule to meet the needs of their learners

National curriculum statements are in bold type and Hampshire Maths team guidance is in standard type.

The links to the Hampshire Assessment Model have been retained so that teacher assessment in each domain can be made at Milestone 1.

**The Hampshire Mathematics team full scheme of learning for KS2 (Year 3- Year 6) offers long and medium-term maps with more detail, with end of year expectations broken down into smaller steps, plus linked units of work with key tasks and teaching points. This is available to schools subscribing to Moodle Plus
<https://maths.hias.hants.gov.uk/>**

Year 6

The curriculum demand across Year 5 and Year 6 is similar in many regards. The notable Y6 curriculum exceptions being in the following domains (see table below).

For autumn term 2020 ensuring pupils revisit the year 4 curriculum, and in some areas the Year 3 curriculum, on the way to working within the year 5 curriculum by the end of the autumn term would enable pupils to work on the key skills, concepts and knowledge in the year 6 curriculum from the spring term.

This might mean following the revised Year 5 Autumn 2020 medium term plans which show prior learning from Year 3 and Year 4 curriculum.

The Year 6 Revision Plans for Spring Term (in Moodle Plus) using SATs questions as anchor tasks would support pupils progressing towards end of Key Stage 2 attainment.

Throughout the autumn term, pupils need to be taught and have time to practise arithmetic strategies for all operations and with a range of numbers as part of all units of work. Linking types of arithmetic calculations with the domains underpinning each unit of work enable pupils to make links between ‘arithmetic’ work and other whole class work on reasoning. Guidance and support for this approach is provided in the Y6 Revision Plan for Spring term found in Moodle Plus.

Year 6 curriculum

<u>Multiplication and Division of decimals</u> - multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$) - divide proper fractions by whole numbers (e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$) - associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$) - 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	<u>Division</u> - 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 <u>Algebra</u> Pupils should be taught to: - use simple formulae - generate and describe linear number sequences - express missing number problems algebraically - find pairs of numbers that satisfy number sentences involving two unknowns - enumerate all possibilities of combinations of two variables.
<u>Fractions</u> Pupils should be taught to: - use common factors to simplify fractions; use common multiples to express fractions in the same denomination - compare and order fractions, including fractions >1 - divide proper fractions by whole numbers (e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$) - associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$) - 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 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	
<u>Measurement</u> Pupils should be taught to: - solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate - use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places - convert between miles and kilometres - recognise that shapes with the same areas can have different perimeters and vice versa - recognise when it is possible to use formulae for area and volume of shapes - calculate the area of parallelograms and triangles	<u>Geometry</u> Pupils should be taught to: - draw 2-D shapes using given dimensions and angles - recognise, describe and build simple 3-D shapes, including making nets - compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons - illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius - recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

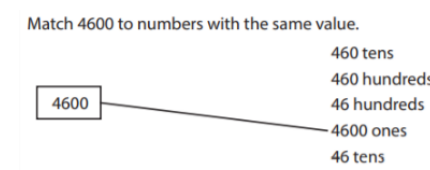
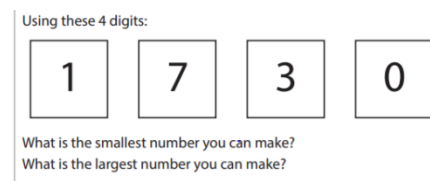
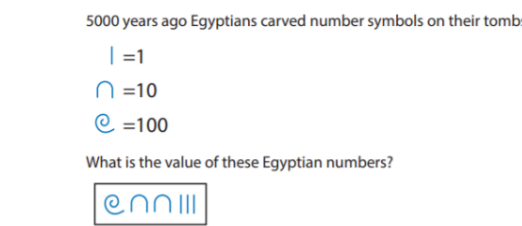
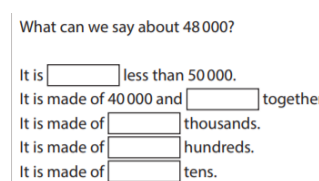
calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm³) and cubic metres (m³), and extending to other units such as mm³ and km³.	<u>Ratio and Proportion</u> Pupils should be taught to: - solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts - solve problems involving the calculation of percentages (e.g. of measures) 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
<u>Statistics</u> Pupils should be taught to: - interpret and construct pie charts and line graphs and use these to solve problems - calculate and interpret the mean as an average	

These plans will need to be adapted to meet the needs of pupils. Number of lessons provides a suggested structure, based on hourly lessons. It is expected that domains within units will be connected and integrated. The structure enables pupils to make links and connections across domains. Pupils should develop reasoning through solving problems in each unit of work.

M1	M2	M3	ARE

Year 5	Year 6
Measurement: Find everyday opportunities to convert units using place value understanding and knowledge of tables facts.	Find everyday opportunities to develop fluency with a broad range of arithmetic strategies in the context of the current unit of work. Revise and consolidate key facts for measurement and conversion of units

Subsequent units should continue to revisit material from previous units to deepen learning, encourage automaticity and allow rich connections to be made across the year.

Date	Unit Focus Lessons	Year 5 Objectives Unit 5.1	Year 6 Objectives Unit 6.1	Types of tasks, Key teaching points, prior learning, Mastery – Year 5	
15 Lessons				Types of tasks, Key teaching points, prior learning, Mastery– Year 6	
START OF NEW ACADEMIC YEAR					
Mon 7 th Sept- Fri 25 th Sept	- NPV - Add & Sub: measurement (length inc perimeter) - Statistics	Solve number and practical problems involving: Read, write, order and compare numbers to at least 100,000 and determine the value of each digit. Identify, represent and estimate numbers using different representations including number-lines Round any number to the nearest 10,100,1000, 10,000 and 100,000 (represent on a number line)	Types of task Possible contexts: Comparing and finding the difference between the numbers of people attending say a large sports event or a music festival provides a good context to think about larger numbers. Pictorial representations: When extending children’s knowledge of the number system number lines provide a key image to help children to develop understanding of the magnitude of the numbers and their relative position in the number system. Starting with a 0 to 10,000 and revising the position of the numbers might be a good starting point. Ask questions like “If I started here on 9000 and counted back 5 what number would I now be on? Where should I record it on the number line?” “If I counted back in 3 jumps of 250 from 3500 where should I start and which number would I be on now? Can you mark that position on the number line?” The use of Gattegno charts, place value grids, base 10 apparatus, place value counters is also important for all learners. Key facts focus: Using the Hampshire Mathematics Team number facts progression documents check back to children’s number facts knowledge from the year 4 expectations. Address as necessary and get started on learning the year 5 facts as soon as appropriate. Solving problems: What is the difference between the number of people attending the match between Southampton and Leicester (29,489) and those attending the Wexham and Dover (5,378) match? The number line is also crucial to support learners when developing their understanding of how rounding numbers works. The use of Gattegno charts, place value grids, base 10 apparatus, place value counters is also important for all learners The number of people attending a popular music festival last year was 72,497. What was this rounded to the nearest 1000? Key teaching points and prior learning – Year 5 Y4: Round decimals in the context of length to the nearest whole number Y4: Compare lengths with the same number of decimal place (up to two decimal places)	- Represent calculations and solutions to problems using a range of representations to help pupils to make links with prior learning and to notice structure and relationships within a domain and between domains - Model decimals PV using place value charts, two part ‘cherry’ models, arrow cards and on number lines. Support calculations involving decimals with place value charts, structured resources eg Dienes and number lines alongside formal methods where appropriate Reference documents to support subject knowledge and CPA approach https://www.ncetm.org.uk/classroom-resources/primm-1-26-composition-and-calculation-multiples-of-1-000-up-to-1-000-000/ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897804/Maths_guidance_year_5.pdf EOY4 Mastery questions NPV:  EOY4 Mastery with GD questions NPV: How many different ways can you write 5510? <i>Pupils should suggest answers such as:</i> 551 tens 55 hundreds and 1 ten 5 thousands and 510 ones  	
	- NPV - Addition and Subtraction including missing number equations/ measurement (length including perimeter)	Solve number and practical problems involving: Read, write, order and compare numbers to at least 10,000,000 and determine the value of each digit. Identify, represent and estimate numbers using different representations including number-lines Round any whole number to a required degree of accuracy (represent on a number line)	Types of task Practical experiences of larger numbers: Use a numberline and Dienes to look at the proportional size of 10,000,000 in comparison with 1,000,000. Refer to a Gattengno chart for support (Year 5) How could I represent the number 1,980,000 using dienes? Read and write numbers: Look at place value of all numbers and include numbers that have a zero within the number. Pupils should be encouraged to count forwards and backwards from a range of given numbers, including 10s, 100s, 1000s and including bridging. Make predictions about what the next number will be and check with a calculator. Include real life examples of when larger numbers are used such as house prices. Compare the value of different houses and order on a numberline. Helen is looking to buy a house. She has been told that she can borrow one million, thirty thousand from the bank. She views two properties. The first property was £1,023,500 and the other was £1,310,000. Are both properties within Helen’s price range? Explain how you know. Rounding – Share real life examples and when pupils will be required to round such a population of people in different places and how population may have changed. Ask questions that require pupils to be accurate and require pupils to round. How many more people lived in St Lucia in 2003 than 2006?? To the nearest 100, how many people lived in St Lucia in 1993? Key Facts Focus: Ensure that pupils understand the relationship between 999,999 and 1,000,000. Teach the rules of rounding numbers and how to make appropriate estimations according to the problem. Teach numbers facts such as ½ of 10,000,000 is 5,000,000. Use a bar model and a numberline to find ¼, 1/5 ¾, 1/10 etc Key teaching points and prior learning - Represent calculations and solutions to problems using a range of representations to help pupils to make links with prior learning and to notice structure and relationships within a domain and between domains - Model decimals PV using place value charts, two part ‘cherry’ models, arrow cards and on number lines. Support calculations involving decimals with place value charts, structured resources eg Dienes and number lines alongside formal methods where appropriate	Reference documents to support subject knowledge and CPA approach https://www.ncetm.org.uk/classroom-resources/primm-1-30-composition-and-calculation-numbers-up-to-10-000-000/ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897805/Maths_guidance_year_6.pdf EOY5 Mastery questions NPV Explore 1 million: Write 1 million in digits. Write down the number that is 1 more than 1 million. Write down the number that is 10 more than 1 million. Write down the number that is 100 more than 1 million  EOY5 Mastery with GD questions NPV Using all of the digits from 0 to 9, write down a 10-digit number. What is the largest number you can write? What is the smallest number you can write? Write down the number that is one less than the largest number. Write down the number that is one more than the smallest number. Captain Conjecture says, ‘Using the digits 0 to 9 we can write any number, no matter how large or small.’ Do you agree? Explain your reasoning.	

Date	Unit Focus Lessons	Year 5 Objectives Unit 5.1 15 Lessons	Year 6 Objectives Unit 6.1 15 Lessons	Types of tasks, Key teaching points, prior learning, Mastery – Year 5										
Types of tasks, Key teaching points, prior learning, Mastery– Year 6														
Mon 7 th Sept- Fri 25 th Sept	- NPV - Add & Sub: measurement (length inc perimeter) - Statistics	- Add and subtract whole numbers with more than 4 digits. Represent solutions appropriately using informal and formal written methods. - Add and subtract mentally with increasingly large numbers e.g. 12,462 – 2300 = 10,612 - 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 - Measure and calculate the perimeter of composite rectilinear shapes in cm and m - Use all four operations to solve problems involving measure (length), using decimal notation.	Types of task Pictorial representations: Children should further consolidate their understanding of the relationship between addition and subtraction using the bar model. For any addition and subtraction equation they should be able to draw proportionally a suitable bar model. They should also be able to state related equations using the inverse operation. Key facts focus: Use PV charts for conversion of units multiplying and dividing by 10 and 100 eg 240mm= 24cm, 150cm= 1.5m, 500cm= 5m, 2300m = 2km 300m Developing flexible and reliable calculation methods: While extending children’s ability to perform formal written methods with understanding there should be frequent opportunities to discuss and make sensible choices about the selection of mental, mental with jottings or formal written methods. All children need to develop these and to value each one. Measurement provides a good context for rounding numbers. This can support estimating when calculating and rounding answers to the nearest cm/m etc. Possibly around 3 lessons on rounding might be appropriate. Solving problems Finding the perimeters of different shapes and problem contexts eg fences and gardens, regular shapes (use different units to use key facts and conversion of units). An equilateral triangle has a perimeter of 1.26m. What is the length of one side in cm? In mm? A regular pentagon has sides that are 54mm long. What is the perimeter of this regular pentagon in cm? Kate needs to buy fencing for her garden. She measures and finds she needs two lengths measuring 13m and one length measuring 11m. Fence panels measure 1.8m x 1.8m and the posts are 2.3m high and 75mm in width. Each panel is supported by a post at each end. How many posts and panels does Kate need? Key teaching points and prior learning Provide regular opportunities to discuss and justify whether a calculation could be solved mentally using facts and related/ derived facts - Y3: Add and subtract numbers mentally including a 3-digit number and ones and a 3-digit number and hundreds. - Y4: Add and subtract with numbers up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate - Y4: Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	- Y4: Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs - Y4: Convert between kilometres, metres, centimetres and millimetres - Y4: Estimate, compare and calculate with measures of length - Y4: Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres - Y4: Solve length problems involving fractions and decimals to two decimal places Reference documents to support subject knowledge and CPA approach https://www.ncetm.org.uk/resources/50640#yr5 updating website https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897804/Maths_guidance_year_5.pdf EOY4 Mastery questions Add and Sub Write down the four relationships you can see in the bar model. <table><tr><td>2300</td><td>1240</td></tr><tr><td colspan="2">3540</td></tr></table>	2300	1240	3540		5000					
2300	1240													
3540														
5000														
	- NPV - Addition and Subtraction including missing number equations/ measurement (length including perimeter)	Solve number and practical problems involving: - Add and subtract whole numbers with more than 4 digits. Represent solutions appropriately using informal and formal written methods. - Perform mental calculations, including with mixed operations and large numbers - Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy - Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why. - Recognise the same areas can have different perimeters and vice versa - Use knowledge of the order of operations to carry out calculations involving the four operations	Types of task Efficient strategies for addition and subtracting: Ensure that pupils are aware of when to select formal written methods and when mental strategies may be more efficient. Give pupils a range of number sentences and encourage them to reason about whether a formal written method should be used or a mental strategy. Mental strategies: Teach mental strategies such as: Rounding and adjusting Application of number bonds to bigger numbers Estimation Problem solving: Solve problems in which pupils are required to select the most efficient strategy. Include problems in which more than one operation is required. Perimeter and area: Apply strategies taught to questions that include area and perimeter. Remind pupils of how to find the perimeter of different shapes. Include real life context to ensure pupils can explain what is meant by area and perimeter and what is the difference between the two. Farmer Joe wanted to make a fence for his cattle. The field has six sides but not all sides are the same length. The total perimeter of the field is 126.4m. What could the sides of the field be? Include decimals as well as larger numbers. Give pupils time to make estimations in relation to perimeter before solving. Find perimeter of composite shapes where missing sides have been included and pupils must find the value of the side using the measurements given, before finding the area and perimeter. Investigate the area and perimeter of shapes. Pupils are to become aware that if a shape is adjusted, the area may stay the same, but the perimeter may not. Key teaching points and prior learning - Provide regular opportunities to discuss and justify whether a calculation could be solved mentally using facts and related/ derived facts - Refer to examples of end of Key Stage SATs paper 1 to discuss strategies and practise linked examples (addition and subtraction) - Measure and calculate the perimeter of composite rectilinear shapes in cm and m.	Reference documents to support subject knowledge and CPA approach https://www.ncetm.org.uk/classroom-resources/primm-1-30-composition-and-calculation-numbers-up-to-10-000-000/ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897805/Maths_guidance_year_6.pdf EOY5 Mastery questions Add & Sub Captain Conjecture says, ‘When working with whole numbers, if you add two 2-digit numbers together the answer cannot be a 4-digit number.’ Do you agree? Explain your reasoning. Write four number facts that this bar diagram shows. <table><tr><td colspan="2">9.5</td></tr><tr><td>3.8</td><td>5.7</td></tr></table>	9.5		3.8	5.7						
9.5														
3.8	5.7													

Ali and Sarah calculate 420 + 221 + 280 using different strategies.

This is Sarah's strategy:

420 + 221 + 280
420 + 221 = 641
641 + 280 = 921
Answer = 921

This is Ali's strategy:

420 + 221 + 280
420 + 280 = 700
700+ 221 = 921
Answer = 921

Which do you prefer?

Find the missing numbers. What do you notice?

Make 9999

5000 + = 9999
4000 + = 9999
3000 + = 9999
2000 + = 9999
1000 + = 9999

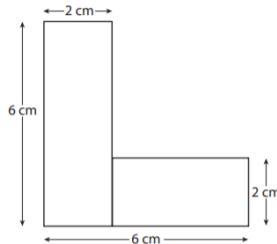
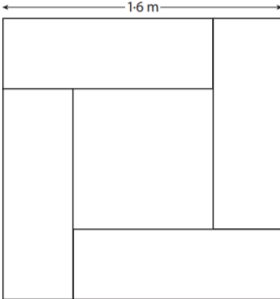
Make 9998

5230 + = 9998
4230 + = 9998
3230 + = 9998
2230 + = 9998
1230 + = 9998

Make 9990

5023 + = 9990
4023 + = 9990
3023 + = 9990
2023 + = 9990
1023 + = 9990

Date	Unit Focus Lessons	Year 5 Objectives Unit 5.2 15 Lessons	Year 6 Objectives Unit 6.2 15 Lessons	Types of tasks, Key teaching points, prior learning, Mastery – Year 5																								
				Types of tasks, Key teaching points, prior learning, Mastery– Year 6																								
Mon 28 th Sept - Fri 16 th Oct	Multiplication and Division/ measurement (area and arrays)	- Represent multiplication and division facts as grid arrays, link to rectangular areas, identifying factors as whole number side lengths of rectangles. - Identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers. Know and use the vocabulary of prime numbers. - Use knowledge of multiples to estimate division calculations e.g. $1075 \div 25 \approx 40$ (since $4 \times 25 = 100$).	Key teaching points and prior learning – Year 5 - Recall 2/3/4/5/6/8 multiplication and division facts for multiplication tables up to 12 x 12 - Y4: multiplying three numbers together. - Y4: Recognise and use factor pairs and commutativity in mental calculations Types of task Pictorial representations: Linking problem solving and reasoning to visualising multiplication and division with resources like number lines and arrays continues to be very important in upper key stage 2. Tasks should help children to see the many links between multiplication and division and not separate them unhelpfully. Key facts focus: Ensure children knowledge of multiplication and division facts remains fresh and accurate. Factors, multiples and primes Ensure children become familiar with this vocabulary and can use it correctly to reason mathematically. Help children to investigate the patterns of different multiples on 100 squares. Reference documents to support subject knowledge and CPA approach https://www.ncetm.org.uk/classroom-resources/primm-2-13-calculation-multiplying-and-dividing-by-10-or-100/ https://www.ncetm.org.uk/classroom-resources/primm-2-21-factors-multiples-prime-numbers-and-composite-numbers/ https://www.ncetm.org.uk/classroom-resources/primm-2-11-times-tables-11-and-12/	EOY4 Mastery questions What do you notice about the following calculations? Can you use one calculation to work out the answer to other calculations? <table><tr><td>$2 \times 3 =$</td><td>$6 \times 7 =$</td><td>$9 \times 8 =$</td></tr><tr><td>$2 \times 30 =$</td><td>$6 \times 70 =$</td><td>$9 \times 80 =$</td></tr><tr><td>$2 \times 300 =$</td><td>$6 \times 700 =$</td><td>$9 \times 800 =$</td></tr><tr><td>$20 \times 3 =$</td><td>$60 \times 7 =$</td><td>$90 \times 8 =$</td></tr><tr><td>$200 \times 3 =$</td><td>$600 \times 7 =$</td><td>$900 \times 8 =$</td></tr></table> EOY4 Mastery with GD questions Place one of these symbols in the circle to make the number sentence correct: >, < or =. Explain your reasoning. <table><tr><td>8×50</td><td>○</td><td>50×8</td></tr><tr><td>8×50</td><td>○</td><td>80×5</td></tr><tr><td>300×3</td><td>○</td><td>5×200</td></tr></table>	$2 \times 3 =$	$6 \times 7 =$	$9 \times 8 =$	$2 \times 30 =$	$6 \times 70 =$	$9 \times 80 =$	$2 \times 300 =$	$6 \times 700 =$	$9 \times 800 =$	$20 \times 3 =$	$60 \times 7 =$	$90 \times 8 =$	$200 \times 3 =$	$600 \times 7 =$	$900 \times 8 =$	8×50	○	50×8	8×50	○	80×5	300×3	○	5×200
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8×50	○	80×5																										
300×3	○	5×200																										
Mon 28 th Sept - Fri 16 th Oct	Multiplication and Division including missing number equations	- Multiply multi-digit numbers up to 4-digits by a 2-digit whole number using a formal written method of long multiplication (see NC appendix for methods). - Divide numbers up to 4-digits by a 2-digit whole number using a formal written method of long division (see NC appendix for methods) , and interpret remainders as a whole number, fraction or by rounding as appropriate for the context. - Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy	Types of task Formal written method: Teach the formal written method of long multiplication and division. When practising, include examples when a mental strategy would perhaps be more efficient and encourage pupils to select the most efficient strategy each time. Problem solving: When dividing, include examples where there is a remainder and pupils need to round according to context – ‘A farmer sold boxes of eggs to the local supermarket. A box of eggs holds 12 eggs. A farmer collected 93 eggs. How many boxes was he able to sell to the supermarket?’ - A coach holds 45 people. 387 children and 35 adults were going on a school trip. How many coaches did the school need for the school trip? What would this look like as a bar model? Can we make an estimation as to the answer? How can we make a sensible estimation? - Remind pupils that when estimating the process should be quick so we need to make the numbers easier to calculate with. - Explore the difference between grouping and sharing to support the concept of division. Support this understanding through arrays and establish why this difference is important to understand. Use bar models to represent more complex problems including multi-step problems. Can pupils multi-represent a problem using a numberline and part/whole models also? Share similar style questions and simply represent the problem; encouraging pupils to identify the number sentence/s within a problem. Key teaching points and prior learning - Represent multiplication and division facts as grid arrays, link to rectangular areas, identifying factors as whole number side lengths of rectangles. - Y5: Calculate and compare the area of rectangles, including squares, and including using standard units (cm² and m²) and estimate the area of irregular shapes. - Y5: Identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers. Know and use the vocabulary of prime numbers. - Use place value knowledge to multiply and divide whole numbers and those involving decimals by 10 , 100 and 1000. - Understand division as grouping, moving on from sharing, to make efficient use of multiplication facts when dividing.	- Represent division calculations (not the solution) as number-lines and bar-models to support conceptual understanding before solving. Refer to examples of end of Key Stage SATs paper 1 to discuss strategies and practise linked examples (multiplication and division) Reference documents to support subject knowledge and CPA approach https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897805/Maths_guidance_year_6.pdf https://www.ncetm.org.uk/classroom-resources/primm-2-23-multiplication-strategies-for-larger-numbers-and-long-multiplication/ https://www.ncetm.org.uk/classroom-resources/primm-2-24-division-dividing-by-two-digit-divisors/ EOY5 Mastery questions Sally’s book is 92 pages long. If she reads seven pages each day, how long will she take to finish her book? A 50 cm length of wood is cut into 4 cm pieces. How many 4 cm pieces are cut and how much wood is left over? Fill in the blanks to represent the problem as division: □ ÷ □ = □ remainder □ Fill in the blanks to represent the problem as multiplication: □ × □ + □ = 50 EOY5 Mastery with GD questions - A 5p coin has a thickness of 1.7mm. Ahmed makes a tower of 5p coins worth 50p. Write down the calculation you would use to find the height of the tower. - A 1m piece of ribbon is cut into equal pieces and a piece measuring 4cm remains. What might the lengths of the equal parts be? In how many different ways can the ribbon be cut into equal pieces?																								

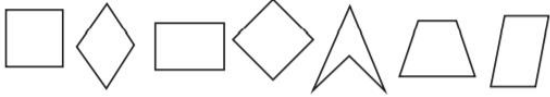
Date	Unit Focus Lessons	Year 5 Objectives Unit 5.2 15 Lessons	Types of tasks, Key teaching points, prior learning, Mastery – Year 5	
Mon 28 th Sept - Fri 16 th Oct	Multiplication and Division/ measurement (area and arrays)	- Understand division as grouping, moving on from sharing, to make efficient use of multiplication facts when dividing. - Represent division calculations (not the solution) as number-lines and bar-models to support conceptual understanding before solving. - Solve two step problems in context, choosing the appropriate operations	Types of task Developing flexible and reliable calculation methods: - There should be frequent opportunities to discuss and make sensible choices about the selection of mental, mental with jottings or formal written methods. - Children should be encouraged to think flexibly to solve calculations - eg to solve 19 x 17 find 20 x 17 and subtract 17. - Solving problems A 6cm X 3cm rectangle has a perimeter of 18cm and an area of 18cm² . - Although the units of measure are different numerically, they are the same. Is this true for all rectangles? Prove it! - A farmer has 24 lengths of fencing to make a rectangular enclosure on a field for her sheep. How can they be arranged to give the sheep the most grass to eat? - Elsie plants cauliflowers in rows of 14. She plants 17 rows. How many cauliflowers has she planted?	Key teaching points and prior learning – Year 5 - Y4: 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 - Y4: Multiply two-digit and three-digit numbers by a one-digit number using formal written layout - Y4: Solve problems involving multiplying and adding including using the distributive law to multiply two-digit numbers by one digit ($37 \times 8 = (30 \times 8) + (7 \times 8)$), the associative law ($(2 \times 3) \times 4 = 2 \times (3 \times 4)$). integer scaling problems (six times taller) and harder correspondence problems such as n objects are connected to m objects (e.g. the numbers of choices of a meal on a menu, or three cakes shared equally between 10 children. Reference documents to support subject knowledge and CPA approach https://www.ncetm.org.uk/classroom-resources/primm-2-10-connecting-multiplication-and-division-and-the-distributive-law/ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897804/Maths_guidance_year_5.pdf
		Calculate and compare the area of rectangles, including squares, and including using standard units (cm² and m²) and estimate the area of irregular shapes	Reference documents to support subject knowledge and CPA approach https://www.ncetm.org.uk/classroom-resources/primm-2-16-multiplicative-contexts-area-and-perimeter-1/	EOY4 Mastery questions The shape below is made from two rectangles. Identify the perimeter of each of the two rectangles. How many 1 cm squares would fit into the smaller rectangle? How many more squares fit into the larger rectangle?  EOY4 Mastery with GD questions The rectangular tiles here are three times as long as they are wide. What is the perimeter of the centre square? 

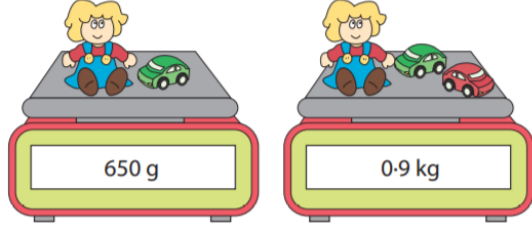
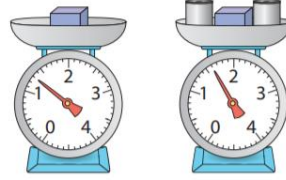
Date	Unit Focus Lessons	Year 5 Objectives Unit 5.3 5 Lessons	Year 6 Objectives Unit 6.3 5 Lessons	Types of tasks, Key teaching points, prior learning, Mastery – Year 5															
Types of tasks, Key teaching points, prior learning, Mastery– Year 6																			
START OF NEW ACADEMIC YEAR																			
Mon 19 th Oct Fri 23 rd Oct	Fractions	- Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths. - Compare and order fractions whose denominators are all multiples of the same number	Types of task Pictorial representations: It is important that children develop further their understanding of fractions as positions on number lines and that they link these to equivalent fractions. A 0 to 2 number line helps children to see that fractions can be greater than 1 and to think about mixed numbers and improper fractions. Tenths and hundredths of a metre could be shown on a metre stick. Key facts focus: Beginning to learn the fraction equivalences eg $3 \div 10 = 3/10 = 0.3$ (these facts could be displayed too on number lines) The work on adding and subtracting fractions whose denominators are all multiples of the same number provides an opportunity to link the work in the previous unit on multiples and factors. Solving problems Three friends share a bar of chocolate. The first eats 3/18, the second 1/3 and the third 2/9. How much chocolate is left? “Show how $7/8 - 3/8$ can be solved using a number line, a bar model a drawing of a pizza ...” Key teaching points and prior learning – Year 5 - Y4: Add and subtract fractions with the same denominator - Y4: Recognise and show using diagrams, families of common equivalent fractions. - Y4: 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 - Check and refresh: Counting forwards and backwards using simple fractions and decimals noting equivalences.	Watch out for: Children who have little idea of the correct relative position of fractions and decimals on the number line. Pupils who might still think that 1/8 is greater than ¼ because 8 is greater than 4. Reference documents to support subject knowledge and CPA approach https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897804/Maths_guidance_year_5.pdf https://www.ncetm.org.uk/classroom-resources/primm-3-07-finding-equivalent-fractions-and-simplifying-fractions/ EOY4 Mastery questions Put these fractions on the number line: $\frac{2}{3}, \frac{1}{2}, \frac{3}{6}, \frac{4}{9}$ Put these fractions on the number line: $\frac{4}{5}, \frac{7}{10}, \frac{5}{10}, \frac{2}{5}$ EOY4 Mastery with GD questions Match each fraction to its decimal equivalent. <table><tr><td>$\frac{1}{2}$</td><td>$\frac{4}{10}$</td><td>$\frac{3}{4}$</td><td>$\frac{1}{4}$</td></tr><tr><td>0.25</td><td>0.75</td><td>0.4</td><td>0.5</td></tr></table> Circle the equivalent fraction to 0.25. <table><tr><td>$\frac{2}{5}$</td><td>$\frac{5}{2}$</td><td>$\frac{25}{100}$</td><td>$\frac{100}{25}$</td></tr></table> Round to the nearest whole number. <table><tr><td>$8\frac{3}{8}$</td><td>8.38</td><td>8.83</td></tr></table> Insert the symbol >, < or = to make each statement correct. $\frac{2}{5}$ of 5 $\frac{1}{4}$ of 4 $\frac{1}{7}$ of 7 $\frac{2}{7}$ of 14 $\frac{2}{3}$ of 9 $\frac{1}{3}$ of 18 Make up three similar statements using >, < or =.	$\frac{1}{2}$	$\frac{4}{10}$	$\frac{3}{4}$	$\frac{1}{4}$	0.25	0.75	0.4	0.5	$\frac{2}{5}$	$\frac{5}{2}$	$\frac{25}{100}$	$\frac{100}{25}$	$8\frac{3}{8}$	8.38	8.83
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Mon 19 th Oct Fri 23 rd Oct	Fractions NB: Same unit continued after half-term	- Use common factors to simplify fractions; use common multiples to express fractions in the same denomination. - Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. - Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions Compare and order fractions, including fractions larger than one.	Types of task Pictorial representations: Use the bar model to represent fractions, revisiting the concept that fractions are equal parts of a whole. Use the bar model to find fraction families. Multi-represent on the number line. Understanding the relationship between multiplication and division and fractions. Apply knowledge of factors and multiples to fractions. Compare and order fractions using secure understanding of fractions alongside finding common multiples and factors. Order fractions: 3/7, 4/8, 7/9 and 2/5 - encourage pupils to reason about the fractions and whether they need to find a common denominator for all fractions - 4/8 is equivalent to ½ and 7/9 is bigger half. 3/7 and 2/5 are smaller than a half. Therefore, the only fractions that I need to find a common denominator for are 3/7 and 2/5. Explore mixed numbers and context mixed numbers to improper fractions. Order fractions including mixed numbers and improper fractions. Use bar models and number lines to represent different fractions. Fractions, decimals and percentages: Use a fraction wall to find decimal and percentages equivalence. Solve questions that include comparison of percentages and fractions. Scott and Mark completed a maths test. The highest amount of marks that they could score in the test was 80. Mark got 65% of the questions correct and Scott managed to get 11/16 of the questions correct. Who scored the highest in the test? Add and subtract fractions including those with different denominators. Model the use of the number line and bar models to calculate with fractions. Why must the denominator be the same? Why don't we add the denominators? Look at what happens when the denominator is added together. The fraction becomes smaller. Use models and images to support and refer to the place on the number line. What happens when we add numbers? Answers get bigger. Now use the number line to add fractions correctly. Key teaching points and prior learning - Use a range of representations, number lines , part- part whole models such as bar models and ‘cherry’ models to model steps in calculating with fractions, particularly showing equivalence and links between place value and decimal fractions - Use part -part whole models to support calculating with mixed numbers and fractions with different denominators	- Refer to examples of end of Key Stage SATs paper 1 to discuss strategies and practise linked examples (fractions) - Y4: Add and subtract fractions with the same denominator - Y4: Recognise and show using diagrams, families of common equivalent fractions. - Y4: 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 - Y5: Compare and order, add and subtract, fractions whose denominators are all multiples of the same number. - Y5:Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths - Y5:Recognise mixed numbers and improper fractions and convert from one form to the other. Write mathematical statements >1 as a mixed number (e.g. $2/5 + 4/5 = 6/5 = 1 \frac{1}{5}$) - Y5:Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams Check and refresh: - Remind pupils of the relationship between fractions, decimals and percentages. Adding/subtracting fractions with the same denominator including calculations that go over one. - Fractions and percentages are part of a whole Reference documents to support subject knowledge and CPA approach https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897805/Maths_guidance_year_6.pdf https://www.ncetm.org.uk/classroom-resources/primm-3-10-linking-fractions-decimals-and-percentages/ https://www.ncetm.org.uk/classroom-resources/primm-3-08-common-denomination-more-adding-and-subtracting/ Year 5 Mastery – fraction section - https://www.ncetm.org.uk/media/lp0o2lgv/mastery_assessment_y5.pdf															

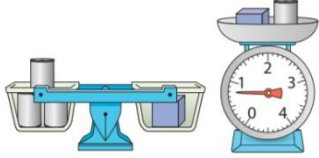
Half-term

Date	Unit Focus Lessons	Year 5 Objectives Unit 5.4 20 Lessons	Year 6 Objectives Unit 6.3 5 Lessons	Types of tasks, Key teaching points, prior learning, Mastery – Year 5																
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START OF NEW ACADEMIC YEAR																				
Mon 2 nd Nov - Fri 27 th Nov	Fractions (5 lessons?)	- Recognise mixed numbers and improper fractions and convert from one form to another. - Write mathematical statements >1 as a mixed number e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$ - Add and subtract fractions with the same denominator beyond 1 and multiples of the same number. - Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	Types of task Initial task : - Show how $1\frac{5}{6} - 1\frac{1}{3}$ can be solved using a number line and drawings of cakes. Pictorial representations: - Developing conceptual understanding of what happens when we add or subtract fractions is a challenge for many learners, but it is a key foundation for success in this area. The use of arrays to support understanding is shown in the NCETM video “Adding fractions with different denominators”. - It is important that children continue to develop further their understanding of fractions as positions on number lines and that they link these to equivalent fractions. A 0 to 3 number line helps children to see that fractions can be greater than 1 and to think about mixed numbers and improper fractions. This could be displayed on a working wall and referred to frequently. Key facts focus: Learn the fraction equivalences e.g. $7 \div 10 = 7/10 = 0.7$, $8 \div 100 = 8/100 = 0.08$ (see the Hampshire maths team’s Number Facts Documents). These facts could be displayed too on number lines Solving problems A shop has 3 metres of red ribbon at the beginning of the day. It sells 25cm, then 1.5m and then a further $\frac{3}{4}$ of a metre of this. How much red ribbon is left? Prove it. - Longer investigative problem solving like those provided by Nrich should be part of children’s mathematical learning journeys. This is important for all children and especially when helping higher achieving learners to get to greater depth. Key teaching points and prior learning – Year 5 - Build on and make links with Units 5.1, and 5.3 Y4: Recognise and write decimal equivalents of any number of tenths or hundredths Y4: Recognise and write decimal equivalents to $\frac{1}{2}$; $\frac{1}{4}$; $\frac{3}{4}$		Check and refresh: Counting forwards and backwards using simple fractions and decimals noting equivalences Reference documents to support subject knowledge and CPA approach https://www.ncetm.org.uk/classroom-resources/primm-3-07-finding-equivalent-fractions-and-simplifying-fractions/ https://www.ncetm.org.uk/classroom-resources/primm-3-08-common-denomination-more-adding-and-subtracting/ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897804/Maths_guidance_year_5.pdf EOY4 Mastery questions Put these fractions on the number line: $\frac{2}{3}, \frac{1}{2}, \frac{3}{6}, \frac{4}{9}$  Put these fractions on the number line: $\frac{4}{5}, \frac{7}{10}, \frac{5}{10}, \frac{2}{5}$  Match each fraction to its decimal equivalent. <table><tr><td>$\frac{1}{2}$</td><td>$\frac{4}{10}$</td><td>$\frac{3}{4}$</td><td>$\frac{1}{4}$</td></tr><tr><td>0.25</td><td>0.75</td><td>0.4</td><td>0.5</td></tr></table> Circle the equivalent fraction to 0.25. <table><tr><td>$\frac{2}{5}$</td><td>$\frac{5}{2}$</td><td>$\frac{25}{100}$</td><td>$\frac{100}{25}$</td></tr></table> Round to the nearest whole number. <table><tr><td>$8\frac{3}{8}$</td><td>8.38</td><td>8.83</td></tr></table> EOY4 Mastery with GD questions Insert the symbol >, < or = to make each statement correct. $\frac{2}{5}$ of 5 $\bigcirc$ $\frac{1}{4}$ of 4 $\frac{1}{7}$ of 7 $\bigcirc$ $\frac{2}{7}$ of 14 $\frac{2}{3}$ of 9 $\bigcirc$ $\frac{1}{3}$ of 18 Make up three similar statements using >, < or =.	$\frac{1}{2}$	$\frac{4}{10}$	$\frac{3}{4}$	$\frac{1}{4}$	0.25	0.75	0.4	0.5	$\frac{2}{5}$	$\frac{5}{2}$	$\frac{25}{100}$	$\frac{100}{25}$	$8\frac{3}{8}$	8.38	8.83
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Mon 2 nd Nov - Fri 6 th Nov	Fractions – cont’d	- Use common factors to simplify fractions; use common multiples to express fractions in the same denomination. - Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. - Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions Compare and order fractions, including fractions larger than one.	Types of task Pictorial representations: Use the bar model to represent fractions, revisiting the concept that fractions are equal parts of a whole. Use the bar model to find fraction families. - Multi-represent on the number line. Understanding the relationship between multiplication and division and fractions. Apply knowledge of factors and multiples to fractions. Compare and order fractions using secure understanding of fractions alongside finding common multiples and factors. Order fractions: $3/7$, $4/8$, $7/9$ and $2/5$ - encourage pupils to reason about the fractions and whether they need to find a common denominator for all fractions - $4/8$ is equivalent to $\frac{1}{2}$ and $7/9$ is bigger half. $3/7$ and $2/5$ are smaller than a half. Therefore, the only fractions that I need to find a common denominator for are $3/7$ and $2/5$. Explore mixed numbers and context mixed numbers to improper fractions. Order fractions including mixed numbers and improper fractions. Use bar models and number lines to represent different fractions. Fractions, decimals and percentages: Use a fraction wall to find decimal and percentages equivalence. - Solve questions that include comparison of percentages and fractions. - Scott and Mark completed a maths test. The highest amount of marks that they could score in the test was 80. Mark got 65% of the questions correct and Scott managed to get 11/16 of the questions correct. Who scored the highest in the test? Add and subtract fractions including those with different denominators. - Model the use of the number line and bar models to calculate with fractions. Why must the denominator be the same? Why don’t we add the denominators? Look at what happens when the denominator is added together. The fraction becomes smaller. - Use models and images to support and refer to the place on the number line. What happens when we add numbers? Answers get bigger. Now use the number line to add fractions correctly. Key teaching points and prior learning - Use a range of representations, number lines , part- part whole models such as bar models and ‘cherry’ models to model steps in calculating with fractions, particularly showing equivalence and links between place value and decimal fractions - Use part -part whole models to support calculating with mixed numbers and fractions with different denominators		- Refer to examples of end of Key Stage SATs paper 1 to discuss strategies and practise linked examples (fractions) Y4: Add and subtract fractions with the same denominator Y4: Recognise and show using diagrams, families of common equivalent fractions. Y4: 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 Y5: Compare and order, add and subtract, fractions whose denominators are all multiples of the same number. Y5:Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths Y5:Recognise mixed numbers and improper fractions and convert from one form to the other. Write mathematical statements >1 as a mixed number (e.g. $2/5 + 4/5 = 6/5 = 1\frac{1}{5}$) Y5:Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams Check and refresh: - Remind pupils of the relationship between fractions, decimals and percentages. Adding/subtracting fractions with the same denominator including calculations that go over one. - Fractions and percentages are part of a whole Reference documents to support subject knowledge and CPA approach https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897805/Maths_guidance_year_6.pdf https://www.ncetm.org.uk/classroom-resources/primm-3-10-linking-fractions-decimals-and-percentages/ https://www.ncetm.org.uk/classroom-resources/primm-3-08-common-denomination-more-adding-and-subtracting/ Year 5 Mastery – fraction section - https://www.ncetm.org.uk/media/lp0o2lgv/mastery_assessment_y5.pdf															

Date	Unit Focus Lessons	Year 5 Objectives Unit 5.4 20 Lessons	Year 6 Objectives Unit 6.4 15 Lessons	Types of tasks, Key teaching points, prior learning, Mastery – Year 5																																																																																																																
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Mon 2 nd Nov - Fri 27 th Nov	Measurement (time and timetables) Geometry (shape, space and angle)	- Complete, read and interpret information in tables, including times tables - Solve problems involving converting between units of time. - Identify 3-D shapes, including cubes and other cuboids, from 2-D representations - Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles - Identify angles at a point and one whole turn (360°), at a point on a straight line and half a turn (180°) and other multiples of 90°. Know that there are four right angles in a complete turn and two right angles in half a turn.	Types of task Initial task - Show children a picture of a regular octagon and a rectangle (which is not a square too). Ask the children to list as many things they can that are the same and different about the shapes. Encourage the use of correct mathematical vocabulary. Consolidating and extending knowledge - Children should be increasing the range of 2-D and 3-D shapes they know. They should learn about the properties of these shapes eg lines of symmetry, lengths of sides, size of angles, faces etc. - They should be aware that shapes can have multiple classifications eg a square is quadrilateral, a rectangle, a rhombus, and a parallelogram. - Children should know that regular shapes have all sides the same length and all angles the same size. Key facts focus: To know complements to 360. - Know complements to 180 Recognise multiples of 90. - Know that the angles in a triangle total 180 degrees - Know that the angles in a quadrilateral total 360 degrees - Know that the angles of a straight line total 180 degrees 360 ÷ 4 = 90 1/4 of 360 = 90 360 ÷ 2 = 180 1/2 of 360 = 180 3/4 of 360 = 270 Solving problems - Referring to a range of 2-D or 3-D shapes represented on a sheet of A4 paper “How many different ways can you find to sort these shapes?” Working with a partner one child puts together a group of shapes based on their own criteria and the other has to work out what criteria they used eg “All these shapes have at least one line of symmetry” ...“None of these shapes have any parallel lines.” - Games like “guess my shape” where one person thinks of a shape and other children or another child have to ask questions about the properties of the shape. Only “yes” or “no” answers can be given. How many questions need to be asked before the shape is discovered?	- Longer investigative problem solving like those provided by Nrich should be part of children’s mathematical learning journeys. This is important for all children and especially when helping higher achieving learners to get to greater depth. Key teaching points and prior learning – Year 5 Y4: Read, write and convert between analogue and digital 12 and 24-hour clocks Y4: Solve problems involving converting from hours to minutes, minutes to seconds, years to months, weeks to days Check and refresh: Pupils’ ability to convert between different units of time. Children’s knowledge of the names and properties of a range of 2-D and 3-D shapes Reference documents to support subject knowledge and CPA approach https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897804/Maths_guidance_year_5.pdf EOY4 Mastery questions Below are five quadrilaterals: a rectangle, a rhombus, a square, a parallelogram and an unnamed quadrilateral. Write the names of each of the quadrilaterals. Draw lines from each shape to match the properties described in the boxes below.  All sides equal Has an acute angle Opposite sides are of equal length All 4 angles are equal Has an obtuse angle - Captain Conjecture says that a rectangle is a regular shape because it has four right angles. Do you agree? Explain your reasoning. - Captain Conjecture says that a quadrilateral can sometimes only have three right angles. Do you agree? Explain your reasoning.																																																																																																																
Mon 9th Nov - Fri 27 th Nov	Percentages Measurement (Time + timetables) – 5 lessons	- Solve problems involving the calculation of percentages, e.g. 15% of 360 and the use of percentages for comparison. - Complete, read and interpret information in tables, including timetables - Solve problems involving durations of time and fractions of time e.g. 2/3 of a day in hours	Types of task Initial task: - Bethany had a voucher that entitled her to 45% off her main meal. On the menu the meal cost £12.50. How much did Bethany pay for her meal? Pictorial representations: Use a fraction wall to find the relationship between fractions and percentages. - Use the language of part and whole to find fraction and percentage equivalents. - Represent the initial task using the bar model, number and part/whole diagram. - Establish understanding of 45%, such as less than half, more than a quarter, closer to a half than a quarter. - Use the bar model to show how 75% can be found by finding 25% and subtracting from 100% or multiplying 25% by 3. - Which strategy did you prefer and why? Could we find other percentages in different ways? Refer to a Gattegno chart to look at dividing by 10 and 100 to find 10% and 1%. - Establish why it is necessary to divide by 10 and 100 using visual representations such as the bar model and the image of dienes. Represent using concrete resources such as dienes and 100 bead strings. Problem solving: Which is bigger? 40% of 150 or 30% of 180? If I told that 35% = 65, what is the whole? Key teaching points and prior learning - Use place value knowledge to find 10% and 1% of any number. - Know that 50% is the same as finding one half, 25% is the same as finding one quarter and 75% is the same as finding three quarters of a quantity (or shape) Y5: Solve problems involving converting between units of time Refer to examples of end of Key Stage SATs paper 1 to discuss strategies and practise linked examples (percentages)	Check and refresh: - The meaning of percentage using the language of part and whole - How to find 10% of an amount. - Simple equivalences between fractions and percentages. - Convert between 12- and 24- hour clock Reference documents to support subject knowledge and CPA approach https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897805/Maths_guidance_year_6.pdf https://www.ncetm.org.uk/classroom-resources/primm-3-10-linking-fractions-decimals-and-percentages/ EOY5 Mastery questions <table><tr><th></th><th colspan="6">Bus Timetable</th></tr><tr><td>Highway Rd</td><td>06:50</td><td></td><td>07:25</td><td>08:45</td><td>09:10</td><td>09:45</td></tr><tr><td>Rain Rd</td><td>07:00</td><td>07:25</td><td>07:41</td><td>08:55</td><td>09:19</td><td>09:53</td></tr><tr><td>Coldcot Rd</td><td>07:11</td><td>07:41</td><td>07:51</td><td>09:04</td><td>09:28</td><td>10:02</td></tr><tr><td>Westland Rd</td><td>07:18</td><td>07:59</td><td>07:59</td><td>09:11</td><td>09:38</td><td>10:11</td></tr><tr><td>Bod Rd</td><td>07:29</td><td>08:12</td><td>08:09</td><td>09:16</td><td>09:47</td><td>10:16</td></tr><tr><td>Kingswell Rd</td><td>07:33</td><td>08:15</td><td>08:14</td><td>09:20</td><td>09:53</td><td>10:21</td></tr><tr><td>Long Rd</td><td>07:45</td><td>08:30</td><td>08:30</td><td></td><td>10:05</td><td>10:40</td></tr></table> Use the bus timetable to answer the following questions: On the 6:50 bus how long does it take to get from Highway Rd to Westland Rd? Can you travel to Long Rd on the 8:45 bus? Which journey between Rain Rd and Kingswell Rd takes the longest time, the bus that leaves Rain Rd at 7:25 or the bus that leaves Rain Rd at 7:41? Explain your reasoning. EOY5 Mastery with GD questions <table><tr><th></th><th colspan="6">Bus Timetable</th></tr><tr><td>Highway Rd</td><td>06:50</td><td></td><td>07:25</td><td>08:45</td><td>09:10</td><td>09:45</td></tr><tr><td>Rain Rd</td><td>07:00</td><td>07:25</td><td>07:41</td><td>08:55</td><td>09:19</td><td>09:53</td></tr><tr><td>Coldcot Rd</td><td>07:11</td><td>07:41</td><td>07:51</td><td>09:04</td><td>09:28</td><td>10:02</td></tr><tr><td>Westland Rd</td><td>07:18</td><td>07:59</td><td>07:59</td><td>09:11</td><td>09:38</td><td>10:11</td></tr><tr><td>Bod Rd</td><td>07:29</td><td>08:12</td><td>08:09</td><td>09:16</td><td>09:47</td><td>10:16</td></tr><tr><td>Kingswell Rd</td><td>07:33</td><td>08:15</td><td>08:14</td><td>09:20</td><td>09:53</td><td>10:21</td></tr><tr><td>Long Rd</td><td>07:45</td><td>08:30</td><td>08:30</td><td></td><td>10:05</td><td>10:40</td></tr></table> Use the bus timetable to answer the following questions: If you needed to travel from Coldcot Rd and arrive at Kingswell Rd by 8:20, which would be the best bus to catch? Explain why. Which journey takes the longest time?		Bus Timetable						Highway Rd	06:50		07:25	08:45	09:10	09:45	Rain Rd	07:00	07:25	07:41	08:55	09:19	09:53	Coldcot Rd	07:11	07:41	07:51	09:04	09:28	10:02	Westland Rd	07:18	07:59	07:59	09:11	09:38	10:11	Bod Rd	07:29	08:12	08:09	09:16	09:47	10:16	Kingswell Rd	07:33	08:15	08:14	09:20	09:53	10:21	Long Rd	07:45	08:30	08:30		10:05	10:40		Bus Timetable						Highway Rd	06:50		07:25	08:45	09:10	09:45	Rain Rd	07:00	07:25	07:41	08:55	09:19	09:53	Coldcot Rd	07:11	07:41	07:51	09:04	09:28	10:02	Westland Rd	07:18	07:59	07:59	09:11	09:38	10:11	Bod Rd	07:29	08:12	08:09	09:16	09:47	10:16	Kingswell Rd	07:33	08:15	08:14	09:20	09:53	10:21	Long Rd	07:45	08:30	08:30		10:05	10:40
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	Geometry (shape and angle/ parts of the circle) – 10 lessons	• Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius. • Draw 2-D shapes using given dimensions and angles • Recognise, describe and build simple 3-D shapes, including making nets. • Identify angles where they meet at a point, on a straight line or are vertically opposite and find missing angles. • Describe positions on the full coordinate grid (all four quadrants) (link to negative numbers on a number-line). • Draw and translate simple shapes in the coordinate plane and reflect them in the axes	<u>Types of task</u> • Key fact focus: • Diameter of a circle = 2 x radius. To label the different parts of a circle. If I tell you the radius of a circle is 4.3cm, what is the diameter? • If I tell you the diameter is 3.4cm, what is the radius? • Consolidate knowledge of 2D and 3D shapes referring to properties as well as names. • Revise the skill of using a protractor and ruler to be accurate. • Look at a range of irregular shapes and describe the shapes according to angles, making estimations as well as measuring. • Reasoning: Can you identify shapes that have two or more obtuse angles? What do you notice? • Problem Solving: Give pupils a 3D net of a cube? If I want the opposite side to have the same pattern, which square should I add the pattern to? Strengthen pupils reasoning process and model how to mathematical reason around such a task. Encourage pupils to share their thinking outload about the mathematical choices they make. • Share a coordinates grid with pupils that include all four quadrants. Include a shape without sharing the mathematical question. Can you tell me what you can see? Allow pupils time to discuss. • Recap how to record coordinates before asking a mathematical problem. • Focus on translation. How can I move the shape to the next quadrant? Include a range of different shapes so that pupils must apply the shape properties. Encourage pupils to use the given squares	<u>Key teaching points and prior learning</u> • Y5: Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • Y5: identify angles at a point and one whole turn (total 360°) • Y5: identify angles at a point on a straight line and ½ a turn <u>EOY5 Mastery questions</u> Identify the regular and irregular quadrilaterals.  <i>Pupils should recognise that a square is the only regular quadrilateral and there are two within this set.</i> <u>EOY5 Mastery with GD questions</u> Which of these statements are correct? • A square is a rectangle. • A rectangle is a square. • A rectangle is a parallelogram. • A rhombus is a parallelogram. Explain your reasoning.
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Date	Unit Focus Lessons	Year 5 Objectives Unit 5.5 15 Lessons	Year 6 Objectives Unit 6.5 15 Lessons	Types of tasks, Key teaching points, prior learning, Mastery – Year 5	Types of tasks, Key teaching points, prior learning, Mastery– Year 6
START OF NEW ACADEMIC YEAR					
Mon 30th Nov - Fri 18 th Dec	NPV/ measurement (Mass and capacity) All four operations	- Round decimals with two decimal places to the nearest whole number and to one decimal place - Convert between different units of metric measure (g/kg; ml/l) Link to place value understanding of scaling up and down by 1000 (x / ÷) - Estimate capacity using standard units to measure liquid (l/ml) and read scales graded in different sized steps (e.g. 0,10,20,30.... 0 , 25 , 50 , 75.... 0, 20, 40,60...)	Types of task Initial task - A short quiz where children are asked to estimate the weight or capacity of a range of supermarket items. These could be shown and passed around with the weights/capacities covered up. Children could be asked to give their answers in different units of measure eg a tin of baked beans in grams and them in kilograms. Possible contexts: - Looking at the value for money of some items from a supermarket eg cost per kg/per 100g etc, might provide a good starting point. Pictorial representations: Reading scales should be linked to reading number lines. The number line is crucial to support learners when developing further their understanding of how rounding numbers works. - The use of Gattegno charts, place value grids, base 10 apparatus, place value counters will help to support learners understanding when multiplying and dividing by 10, 100 and 1000. Estimating - When developing their knowledge of measures it is important children become familiar with some benchmarks they can use before calculating and when considering the reasonableness of their answers. - For capacity these might include a 500ml, 1l and a 2l drinks bottles. - For mass a 500g, 1 kg bags of sugar or rice are useful to become familiar with. - Include opportunities to estimate a range of objects, including possibly a bag of supermarket shopping, to help children to improve the reasonableness of their estimating. Key facts focus: 1kg = 2.20 lbs 1 l = 1.8 pints Solving problems - When solving problems children should estimate their answers first and consider the reasonableness of their answers when they have solved their problems. Frequent opportunities to discuss the selection of mental, mental with jottings or formal written methods should be provided. - A 400g tin of butter beans contains 160g of water. The rest of the 400g is weight of the beans. How much do they weigh and what fraction of the whole of the tin is this? What fraction of the whole of the weight is the water? - Longer investigative problem solving like those provided by Nrich should be part of children’s mathematical learning journeys. This is important for all children and especially when helping higher achieving learners to get to greater depth.	Key teaching points and prior learning – Year 5 - Build on and make links with Unit 5.1, Unit 5.2 and Unit 5.4 Measurement Y4: Convert between kilometres, metres, centimetres and millimetres Y4: Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres Y4: Solve length problems involving fractions and decimals to two decimal places Y4: Round decimals in the context of length to the nearest whole number Check and refresh: The relationship between grams and kilograms. The relationship between millilitres and litres. Reference documents to support subject knowledge and CPA approach https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897804/Maths_guidance_year_5.pdf https://www.ncetm.org.uk/media/xega5ms1/ncetm_spine2_segment17_y4.pdf EOY4 Mastery questions - An empty box weighs 0.5kg. Ivy puts 10 toy bricks inside it and the box now weighs 2kg. How much does each brick weigh? - Put these amounts in order starting with the largest. - Half of 3 litres - Quarter of 2 litres 300 ml Explain your thinking. EOY4 Mastery with GD questions How much does the car weigh in grams? How much does the doll weigh in grams?  Fill in the missing boxes so that the amounts are in order from smallest to greatest. $\frac{1}{2}$ a litre millilitres $\frac{1}{3}$ of 2 litres millilitres $\frac{1}{4}$ of 3 litres	
Mon 30th Nov - Fri 18 th Dec	NPV/ measurement (Mass and capacity) All four operations	- Round any whole number to a required degree of accuracy - 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. - Solve problems involving the calculation and conversion units of measure (g/kg ; ml/l) using decimal notation up to three decimal places .Link to place value understanding of scaling up and down by 1000 (x / ÷) - Use, read, write and convert between standard units, converting measurements of mass and capacity from a smaller unit of measure to a larger unit and vice versa. - Understand and use equivalences between	Types of task Initial task: 5 boxes of toy cars weighed a total of 1 $\frac{1}{4}$Kg. A box containing a toy lorry weighed double the amount of a box containing a toy car. What is the weight of a box containing a toy lorry? Pictorial diagrams - Use the bar model and number line to represent the problem. On a number line mark points of weight such a $\frac{1}{4}$ of a kg, $\frac{1}{2}$ a kg and include the gram conversion. What is 125 grams? This is an 1/8 of a Kg and the same as 0.125kg. Share similar facts such as this. - Focus on multiplying and dividing numbers by 10, 100 and 1000. Include conversions such as 0.23kg = ____ g? where there is a place holder missing. - Complete a similar process for capacity using the bar model and the number line – A bucket can be filled by a 750ml measuring jug by filling the jug 5 $\frac{1}{2}$ times. How much water does the bucket hold? Estimating - Teach pupils that when estimating, refer to real life examples such as 1 bag of sugar is 1kg and a 2-litre bottle, a can of coke holds 330ml. If I asked you to estimate how much a mug holds, think carefully about the real-life examples that you know such as a can of coke. Use this information to make a reasonable estimation. Teach pupils equivalences using metric units and common imperial units. Include approximations such as 8km = 5 miles and ask questions accordingly. Problem solving:	Check and refresh: - The vocabulary of factors, multiples, square numbers, prime numbers and prime factors. - Units of measure and converting units of measure. Watch out for: - Pupils understanding of decimals in the context of measure – what does 0.45kg equal in terms of grams? Use a place value chart to discuss conversion further. Reference documents to support subject knowledge and CPA approach https://www.ncetm.org.uk/classroom-resources/primm-1-30-composition-and-calculation-numbers-up-to-10-000-000/ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897805/Maths_guidance_year_6.pdf EOY5 Mastery questions The weight of a football is 400g. How much do five footballs weigh in kilograms? Complete this: $\frac{1}{2}$ kg = ____ g $\frac{1}{4}$ kg = ____ g Which has the greater mass? $\frac{1}{5}$ kg or $\frac{1}{10}$ kg Explain why. A box weighs 1.3 kg. A box and two tins weigh 1.6 kg. How much does one tin weigh in grams? 	

		metric units and common imperial units such as pounds and pints. Solve problems involving the calculation and conversion units of measure (g/kg ; ml/l) using decimal notation up to three decimal places .Link to place value understanding of scaling up and down by 1000 (x / ÷)	- Mary walked 27 and $\frac{1}{2}$ miles. How far did Mary walk in km? Use the number line to demonstrate how miles can be converted into km by showing that for every jump of 5 there is 8km. What do we know about the 2 $\frac{1}{2}$ miles remaining? Key teaching points and prior learning - Build on and make links with Unit 6.1 and Unit 6.2 - Estimate capacity using standard units to measure liquid (l/ml) and read scales graded in different sized steps (e.g. 0,10,20,30.... 0 , 25 , 50 , 75.... 0, 20, 40,60...) - Refer to examples of end of Key Stage SATs paper 1 to discuss strategies and practise examples	EOY5 Mastery with GD questions A football weighs 0.4kg. Three footballs weigh the same as eight cricket balls. How many grams does a cricket ball weigh? Here are some tins and boxes on two different scales. How many grams does a tin weigh? How many grams does the box weigh? True or false? $1.5\text{ kg} + 600\text{ g} = 2.1\text{ kg} + 300\text{ g}$ $32\text{ cm} + 1.05\text{ m} = 150\text{ cm} - 0.13\text{ m}$ $\frac{3}{4}\text{ l} + 0.05\text{ l} = \text{half of } 1.6\text{ l}$ Explain your reasoning. 
		Use all four operations to solve problems involving measure (mass and capacity) using decimal notation including scaling. - Pupils use and explain the equals sign to indicate equivalence, including in missing number problems (for example, $13 + 24 = 12 + 25$; $33 = 5 \times ?$).	Types of task Initial task - Provide children with a selection of problems (these could be written on cards) requiring 2, 3 or more steps to solve. Ask them to identify the calculations required to solve each problem and then to decide which calculations should be solved mentally, which with jottings and which would be better with a formal written method. Ask children to discuss their choices. Encourage children to be flexible in their choices and to focus on both being reliable and efficient. Pictorial representations: - Children should further consolidate their understanding of the relationship between addition and subtraction using the bar model. For any addition and subtraction equation they should be able to draw proportionally a suitable bar model. They should also be able to state related equations using the inverse operation. Developing flexible and reliable calculation methods: While extending children’s ability to perform formal written methods with understanding there should be frequent opportunities to discuss and make sensible choices about the selection of mental, mental with jottings or formal written methods. All children need to develop these and to value each one. - Measurement provides a good context for rounding numbers. This can support estimating when calculating and rounding answers to the nearest cm/m etc. Solving problems - A recipe for Christmas pudding for 8 people requires 48g of flour, 160g of soft fruit and 80g of nuts. How many grams of flour, soft fruit and nuts are needed so the recipe serves 6 people? How many grams of flour, soft fruit and nuts are needed so the recipe serves 10 people? - Longer investigative problem solving like those provided by Nrich should be part of children’s mathematical learning journeys. This is important for all children and especially when helping higher achieving learners to get to greater depth. - Y4: Derive, recall and use multiplication (and division) facts up to 12x 12 - Y4: Solve problems including missing number problems involving multiplication and division, recording solutions with a range of representations to include number-lines, bar-models and arrays. Y4: Solve problems involving multiplying and adding (partitioning and recombining). E.g. $37 \times 8 = (30 \times 8) + (7 \times 8)$.	Key teaching points and prior learning – Year 5 Addition and Subtraction Y2: Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 Y3: Compare and order numbers from zero up to 1000; using < , > and = signs Y3: Read and write numbers to at least 1000 in numerals and in words Y3: Add and subtract numbers mentally including a 3-digit number and ones and a 3-digit number and hundreds. Y4: Estimate the answer to a calculation and use inverse operations to check answers Y4: Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. Multiplication and Division Y2/3: Recall and use multiplication and division facts for the 2,3,4,5,8,10 multiplication tables Y4: Use place value, known and derived facts to multiply and divide mentally - Y4: Represent multiplication and division facts as arrays using a grid (rather than dots) and a number-line Reference documents to support subject knowledge and CPA approach https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897804/Maths_guidance_year_5.pdf https://www.ncetm.org.uk/classroom-resources/primm-2-22-combining-multiplication-with-addition-and-subtraction/ https://www.ncetm.org.uk/classroom-resources/primm-2-17-structures-using-measures-and-comparison-to-understand-scaling/
		- Use knowledge of the order of operations to carry out calculations involving the four operations - Identify common factors, common multiples and prime numbers. - Express missing number problems algebraically - Find pairs of numbers that satisfy pairs of numbers involving two unknowns - Solve problems involving addition, subtraction, multiplication and division, deciding which operations and methods to use and why - Use estimation to check answers to calculations	Types of task Recap the terminology from Year 5 and unit 6.2 including factors, square numbers, prime numbers and prime factors. Investigative questions such as: ‘the factors in a number totalled 24. What could the number be?’ Pictorial representations – - Use the number line to help pupils identify the factor pairs and understand when they have identified all the factors of a number. - Use the bar model to demonstrate that not all numbers have an even number of factors making the link with square numbers. Solving calculations - Give pupils calculations such as $21 \times 42 = ?$ - Identify the factors and understand how this could be rewritten as $7 \times 3 \times 6 \times 7 =$. - Now encourage pupils to identify the prime factors and that this could also be rewritten as $7 \times 3 \times 2 \times 3 \times 7 =$ - Reason about the order of the numbers and where the starting point may be.... I would reorder the number sentence so that I start with 7×7 first as I know this times table fact, however multiplying by 7 with larger numbers could prove tricky. - I would reorder this to be $7 \times 7 \times 3 \times 2 =$ as I would end with multiplying by 2 as this is simply doubling. - Encourage pupils to use the language of common multiples and factors as they are looking at different stages. Missing number problems:	Key teaching points and prior learning - Know that distributivity can be expressed as $a(b + c) = ab + ac$. (e.g. $13 \times 8 = 8(10 + 3)$) - Understand the terms factor, multiple and prime, square and cube numbers and use them to construct equivalence statements (for example, $4 \times 35 = 2 \times 2 \times 35$; $3 \times 270 = 3 \times 3 \times 9 \times 10 = 92 \times 10$). - Refer to examples of end of Key Stage SATs paper 1 to discuss strategies and practise examples Check and refresh: - The equal sign within a number sentence can be in different places and what the equal sign represents. Watch out for: - Pupils understanding of prime numbers and that 1 is not a prime number because it does not consist of two factors. Reference documents to support subject knowledge and CPA approach https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897805/Maths_guidance_year_6.pdf https://www.ncetm.org.uk/classroom-resources/primm-2-23-multiplication-strategies-for-larger-numbers-and-long-multiplication/ https://www.ncetm.org.uk/classroom-resources/primm-2-29-decimal-place-value-knowledge-multiplication-and-division/ https://www.ncetm.org.uk/classroom-resources/primm-2-28-combining-division-with-addition-and-subtraction/

		and determine, in the context of a problem, an appropriate degree of accuracy.	• Show pupils the following style questions: $25 \times \underline{\hspace{1cm}} = 34 + \underline{\hspace{1cm}}$ • What does the equal sign mean within this number sentence? What could the answer be? Is there more than one? What else may the answer be? – • Develop the systematic approach. • Mathematical reasoning: What can you tell me about the number that will complete the addition number sentence? • The ones column for the missing number will always be a 1 or a 6 as all multiples of 25 end in 0 or 5. • Algebra: Begin to look at how maths can be expressed algebraically. $a + b = c$. $c \div 8 = 2.5$. What is the value of c? What could the value of a and b be? $3x = 21$. • What is the value of x? • Give pupils simpler equations to understand that numbers can be replaced with letters and then build upon their learning to more complex tasks such as $3x + 3y = 13.5$. If $y = 4$, what is the value of x? •	EOY5 Mastery questions 8 is a multiple of 4 and a factor of 16 6 is a multiple of 3 and a factor of is a multiple of 5 and a factor of is a multiple of and a factor of EOY5 Mastery with GD questions Captain Conjecture says, ‘Factors come in pairs so all numbers have an even number of factors.’ Do you agree? Explain your reasoning.
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