Date:	The Bigger Picture topic	Step	Learning intention TBAT	Support	Interleaving Topics	Hegarty Maths
	Rationale:					
6/9/2021	**Block 1** Straight line graphs	**Check in** 1.Lines parallel to the axis y=x and y=-x (R)	TBAT identify lines that are parallel to the axis y=x and y=-x	-Ensure students are confident in plotting individual coordinates in all four quadrants -Emphasise the relationship between coordinates and the equation of lines parallel to the axes. -(3,7) and (3,2) what do the points have in common?	Gradient Coorodinates Substitution	
		2. Using tables of values (R)	TBAT substitute into a table of values and draw straight line graphs	-Make sure students are confident in substituting negative values into equations -Use calculators -List coordinate pairs from the tables before plotting the graphs	Function machines Linear sequences	HM 206 (Straight line graphs 1)
		3. Compare gradients	TBAT compare positive and negative gradients	-Use graphical software to save time plotting graphs -Compare y=x and y=-x graphs to emphasise the gradients are 1 and -1		HM 201, 202, 203, 204
		4. Compare intercepts	TBAT compare positive and negative intercepts	-Use graphical software to save time plotting graphs - Discuss that y=kx + 0 is the same as y=kx	Substitution	
		5. Understand and use y=mx+c	TBAT understand and use y=mx+c	-Link to steps 3 and 4 -Use graphical software to demonstrate lines with the same gradient are parallel -Focus on stating the gradient and intercept by rearranging unfamiliar equations eg y=3-2x would become y=-2x+3		HM 207 (Straight line graphs 2)
		6. Equations in the form y=mx+c	TBAT form equations using y=mx+c		Rearranging formulae	HM 210 (Straight line graphs 5 rearranging)
		7. Find the equation of a line from a graph	TBAT find the equation of a line from a graph	-Start with lines that only vary the y intercept -Find gradients with scaffolded graphs with triangles drawn under the lines -Encourage students to consider if the gradient is positive or negative before doing any calculations	Linear sequences Inverse operations Substitution	HM 208, 209

		8. Interpret gradients and intercepts of real-life graphs	TBAT interpret gradients and interpret gradients and intercepts of real-life graphs	-Use graphical software to show how graphs change for various inputs -Work with only one context to begin, vary the gradient and no intercept -Introduce standing charge to bring in the interpretation of c	Direct proportion	
20/9/2021		9. Real life graphs involving inverse proportion	TBAT apply inverse proportion to real-life graphs		Inverse proportion	
		10. Perpendicular lines	TBAT understand what perpendicular lines are		Reciprocals Multiplication Gradient	HM 215, 216
		Revision/ **check out**	TBAT consolidate knowledge of straight line graphs (block 1)			
	Rationale:					
	Block 2 Forming and solving equations	**Check in** 1.One/two-step equations and inequalities (R)	TBAT solve one/two-step equations and inequalities	-Review Y7 & Y8 methods of solving all types of equations and inequalities using cups, counters, bar modelling or function machines -Use calculators to reduce cognitive load and remove arithmetic barrier -Form links between equations and inequalities, compare 2x=30 and 2x≤30 etc	Greater than, less than Inverse operations Decimals Negative numbers	HM 178, 269
		2. Equations and inequalities with brackets	TBAT solve equations and inequalities with brackets	-Review expanding brackets first using bar models to help students visualise the steps needed to solve the equations/inequalities -Move systematically from 2y=30 to 2(y-5)=30 to 2(2y-5)=30	Expanding brackets Area of quadrilaterals and triangles	HM 179, 180, 181, 182
		3. Inequalities with negative numbers	TBAT solve inequalities with negative numbers	-Review negative number arithmetic, **_be prepared to omit this step if not accessible to students_** -Only move to multi-step problems once one-step is secure		HM 270 (negative x)

		4. Solve equations with unknowns on both sides	TBAT solve equations with unknowns on both sides	-Start with only positive terms and use bar models or balancing method depending on student preference -Only move to negative terms if students are secure in applying technique -Ensure students check answers by substitution	Bar models for balance method Function machines	HM 184, 185
		5. Solve inequalities with unknowns on both sides	TBAT solve inequalities with unknowns on both sides	-Start with only positive terms and use bar models or balancing method depending on student preference -Only move to negative terms if students are secure in applying technique -Ensure students check answers by substitution	Perimeter of shapes	HM 271
4/10/2021		6. Equations and inequalities in mathematical contexts	TBAT understand the application of equations and inequalities in mathematical contexts	-Start with "think of a number" type problems -Make sure students always define the letters being used eg a is the smallest angle -Check answers by substitution for students to learn whether their answers make sense in the given context	Vertically opposite angles Angles in parallel lines Mean and range	HM 487 (angles in triangle) 552 Perimeter 565 Angles in polygons
		7. Formulae and equations	TBAT generate equations using formulae	-Emphasise the difference between a formula and an equations -Use only a small number of familiar formulae to generate equations so the solutions can be checked meaningfully, link to scientific formulae where possible	Substitution Area & perimeter Rearranging formulae Algebraic notation	HM 155 (Writing formulae and simple substitution)
		8. Rearrange formulae (one step) 9. Rearrange formulae (two step)	TBAT rearrange formulae using one and two step calculations	-Use only a small number of familiar formulae to generate equations so the solutions can be checked meaningfully, link to scientific formulae where possible -Perimeter and area formulae are good formulae to use to aid retrieval -Initially use formulae with the same structure before moving to more abstract eg A=lw paired with p=km	Inverse operations Fractions of amounts Scientific formulae	HM 280 (One step) 281 (Two step)

		10. Rearrange complex formulae	TBAT rearrange complex formulae		Squares & square roots Expanding brackets	HM 283, 284, 285, 286
		Revision/ **check out**	TBAT consolidate knowledge of forming and solving equations (block 2)			
	Rationale:					
	Block 3 Testing conjectures	**Check in** 1. Factors, multiples and primes (R)	TBAT apply the knowledge of factors, multiples and prime numbers	-Model using counters and arrays to show factors and numbers that cannot be formed into an array are prime -Use lists to support finding the HCF and LCM	Odd, even, square, cube numbers	HM 27 Factors 33 Multiples 28 Prime
		2. True or false 3. Always, sometimes, never true	TBAT identify if statements are true or false and whether they are always, sometimes or never true	-Use areas of maths students are most comfortable with to reinforce prior learning eg "a hexagon has 8 sides" -Encourage students to articulate and write down their reasoning -Encourage students to work systematically to test statements, first small numbers then large, then fractions, decimals and negative numbers	Fractions, decimals, percentages Squares, cubes Angles Properties of polygons	
		4. Show that	TBAT prove show right questions	-Focus questions on prior learning eg expansion of brackets, area of shapes etc -Move onto connecting two similar constructs eg showing the solutions of two equations are the same	One/two-step equations Unknowns both sides	HM 161 Expand two brackets and simplify
18/10/2021		5. Conjectures about number	TBAT test conjectures about number	-Stay with connections between odd and even using diagrams and objects to illustrate generalisations -If appropriate look at three or more numbers eg odd + odd + odd	Substitution Sequences	
		6. Expand a pair of binomials	TBAT expand a pair of binomials	-Revise single bracket expansion first -Use algebra tiles or area model diagrams to obtain results -Check answers by substitution -Work with positive terms only	Expanding brackets Quadratics	HM 162, 163, 164, 165

		7. Conjectures with algebra 8. Explore the 100 grid	TBAT test conjectures about algebra	-Concentrate on conjectures that can be tested through substitution -Use concrete manipulatives or diagrams to represent expressions -Spend time exploring the structure of grid eg relationship between numbers in the column, diagonally below and diagonally above -Explore additive relationships before moving to multiplicative, **be prepared to omit multiplicative examples**		
		Revision/ **check out**	TBAT consolidate knowledge of testing conjectures (block 3)			
25/10/2021				**HALF TERM**		
	Rationale:					
1/11/2021	**Block 4** Three-dimensional shapes	**Check in** 1. Know names of 2D and 3D shapes 2. Recognise prisms (edges and vertices)	TBAT recognise the names and properties of 2D and 3D shapes	-Use geoboards/dotty paper to compare 2D shapes and help students recognise properties -Use sorting activities with 3D shapes use real life objects eg balls, ice cream cones, boxes etc -Emphasise language, use sides for 2D but edges for 3D		HM 822 2D 829 3D
		3. Accurate nets of cuboids and other 3D shapes	TBAT draw accurate nets of cuboids and other 3D shapes	-Start with cubes and take time making the cube from different nets -Move to cuboids by making nets the same way as cubes -Only move to abstract shapes if students are ready, omit if not		HM 833, 834
		4. Sketch and recognise nets of 3D shapes	TBAT sketch and recognise nets of 3D shapes	-Use cutting and folding to support students visualisation skills -Ask questions before starting to sketch eg How many faces will there be? What shape will the faces take?	Area & perimeter	HM 835, 836
		5. Plans and elevation	TBAT draw plans and elevations of 3D shapes	-Make shapes out of multilink cubes -Ask students how the view would change if you add or takeaway one cube		HM 837, 838, 839, 840

		6. Find area of 2D shapes (R)	TBAT find the area of 2D shapes	-Provide formula sheet -Remind students of links between the area of rectangles and triangles and of rectangles and parallelograms	Quadrilaterals Circles Compound shapes	HM 554 Rectangles 556 Parallelograms 557 Triangles
		7. Surface area of cubes and cuboids	TBAT find the surface area of cubes and cuboids	-Use full scale nets made earlier in topic to demonstrate -Encourage students to draw sketches of nets and identify equal faces -Use exploded diagrams to help students see which faces are equal	Net of 3D shapes	HM 584
		8. Surface area of triangular prisms	TBAT find the surface area of triangular prisms	-Use full scale nets made earlier in topic to demonstrate -Encourage students to draw sketches of nets and identify equal faces -Use exploded diagrams to help students see which faces are equal	Triangles Perpendicular lines	HM 585
		9. Surface area of cylinders	TBAT find the surface area of cylinders	-Use full scale nets made earlier in topic to demonstrate -Encourage students to draw sketches of nets and identify equal faces -Use exploded diagrams to help students see which faces are equal	Circles	HM 586
15/11/2021		10. Volume of cubes and cuboids	TBAT find the volume of cubes and cuboids	-Make cubes and cuboids out of interlocking cubes to demonstrate how he volume changes between 2 by 2 by 1, 2 by 2 by 2, 2 by 2 by 3 and so on -Emphasise the difference between volume and surface area	Substitution into formulae Inverse operations	HM 568, 569
		11. Volume of prisms and cylinders	TBAT find the volume of prisms and cylinders	-Start with simple prisms and only extend to larger examples if students show understanding -Link right-triangular prism being half of a cuboid to a triangle being half of a rectangle	Substitution into formulae Inverse operations Perpendicular lines	HM 570 Prisms HM 572 Cylinders
		12. Volume of cones, pyramids and spheres	TBAT find the volume of cones, pyramids and spheres			HM 576 Cones, 579 Pyramids, 580 Spheres

		Revision/ **check out**	TBAT consolidate knowledge of 3D shapes (block 4)			
	Rationale: Familiar with SSS, SAS and ASA from years 7&8					
	Block 5 Construction & Congruency	**Check in** 1. Draw and measure angles (R)	TBAT draw and measure angles	-Revise recognising acute, obtuse and reflex angles -Encourage students to consider both scales on a protractor before choosing the correct one -Model using the visulaiser -Only move to constructing reflex angles in triangles if students are secure. Allow calculators to be used to find the difference from 360	Angle facts Estimation	HM 458, 459 Measuring angles
		2. Construct and interpret scale drawings (R)	TBAT construct and interpret scale drawings	-Revise conversion of metric units and multiplication/division of 10 as a starter -Work with 1:10 and 1:100 when establishing the ideas of construction/interpretation -Compare diagrams of the same objects drawn to different scales	Ratio Conversions Estimation	HM 864, 865, 866, 867
		3. Locus of distance from a point 4. Locus of distance from a straight line	TBAT find the locus from a point and from a straight line	-Use exemplar questions to develop meaning eg placing coins and counters to form the loci from points and lines -Use long tape measures to form paths eg standing 2 metres from a point or wall outside	Construction lines Circles	HM 674
		5. Locus equidistant from two points	TBAT find the locus equidistant from two points	-Use exemplar questions to develop meaning eg placing coins and counters to form the loci from points and lines -Use long tape measures to form paths eg standing 2 metres from a point or wall outside		HM 675
29/11/2021		6. Construct a perpendicular bisector	TBAT construct a perpendicular bisector from a point	-Practice drawing circles, semicircles and sectors to refine motor skills -Use visualiser to model the construction of a perpendicular bisector.	Area of triangles Area of circles Sector of circles	HM 660

		7. Construct a perpendicular from a point		-Emphasise the need to hold the compass at the top rather than the arms		
		8. Construct a perpendicular to a point 9. Locus of distance from two lines	TBAT construct a perpendicular bisector to a point and from two lines	-Link the perpendicular bisector to the locus equidistant from two points -Use good quality equipment, tighten compasses to ensure it doesn't slip -Make sure diagrams are large enough for students to perform constructions easily		HM 662, 663
		10. Construct an angle bisector	TBAT construct an angle bisector	-Model using visualiser -Start with angles at least 40 degrees, making sure the arms are long enough to perform the construction -Encourage students to turn their books to make angles in different orientations easier to bisect -Practice protractor skills by measuring angles bisectors to check accuracy -Link to the locus equidistant from two lines	Estimation	HM 661
		11. Construct triangles (R)	TBAT construct triangles using ASA, SAS and SSS	-Start with ASA and SAS before moving to SSS. Do examples for both so students are thinking about both types of triangle -Draw larger rather than smaller triangles to then practice angle and line bisectors -Provide a bulleted list of steps for each construction so students can start to work independently	Properties of triangles	HM 683
		12. Identify congruent figures	TBAT identify congruent figures	-Revise names and properties of shapes -Cut out copies of shapes to check they are identical apart from rotation and reflection	Reflection Rotation Perimeter	
		13. Explore congruent triangles 14. Identify congruent triangles	TBAT explore and identify congruent triangles	-Work with larger triangles as the margin of error will be smaller -Focus on identifying pairs of triangles that are identical -Give students list of SSS,SAS,ASA,RHS to make final decision, do not expect these to be done from memory at this stage	Angles in parallel lines	HM 680, 681 682

		Revision/ **check out**	TBAT consolidate knowledge of construction and congruence (block 5)			
		Revision blocks 1-5				
13/12/2021		Revision blocks 1-5				
		Revision blocks 1-5				
		Autumn assessment				
		Reflection				
20/12/2021		**CHRISTMAS HOLIDAYS**				
3/1/2022	Rationale: Detailed suggestions given in Y7 Spring block 4 (work with direct number) Y7 Spring block 5 (addition & subtraction) Y8 Autumn block 3 (multiplication & division) Y8 Spring block 5 (standard form)					
	Block 6 Numbers	**Check in** 1. Integers, real and rational numbers	TBAT understand what real, rational integers are	-Emphasise that integers can be positive or negative and that 0 is an integer -Link rational numbers to fractions -Revise place value to show that terminating decimals are rational	Solving equations Ratio Negative numbers	
		2. Use surds	TBAT use surds		Calculator (square root/cube root) Simplifying/collecting like terms	HM 111 115 Simplifying surd
		3. Work with direct number (R)	TBAT work with direct numbers (negative numbers)	-Use horizontal and vertical number lines to illustrate the position of positive and negative numbers -Perform additions and subtractions using number lines. Link calculations like -99 +101 to 100-99 -Check answers on calculators to support students using the sign change key efficiently	Number sense Inverse operations Substitution	HM 41
		4. Solve integer problems	TBAT solve integer problems	-Revise calculator and non-calculator methods	Money	

				-Emphasise the interpretation of questions over procedural fluency -Start with "goal-free" problems -Give questions one sentence at a time to ease cognitive load -Replace difficult numbers with easier ones if students are unsure		
		5. Solve problems with decimals	TBAT solve problems with decimals	-Use calculators to check answers -Use estimation so students can see if their answers are realistic	Money Percentages Place value	HM 51
		6. HCF & LCM (R)	TBAT understand the difference between finding the highest common factor HCF and lowest common multiple LCM	-Revise factors and multiples -Carefully vary examples to show the LCM is not always the product of the two numbers -Focus on listing strategies before moving to Venn diagrams	Time Prime numbers	HM 31, 32, 34, 35
		7. Add and subtract fractions (R)	TBAT add and subtract fractions with different denominators	-Use number lines and bar models to ensure understanding and make sense of answers -Model using the fraction key on a calculator to check answers	Improper fractions Difference	HM 66
		8. Multiply and divide fractions (R)	TBAT multiply and divide fractions	-Use number lines and bar models to ensure understanding and make sense of answers -Model using the fraction key on a calculator to check answers		HM 68, 69 Multiply HM 70 Divide
		9. Solve problems with fractions	TBAT solve problems with fractions	-Use number lines and bar models to ensure understanding and make sense of answers -Model using the fraction key on a calculator to check answers	Perimeter Area Ratio	HM 80
		10. Numbers in standard form (R)	TBAT work with numbers in standard form	-Revise conversion between ordinary and standard form with use of place value grids -Ensure students can use the x10 key on the calculator and do not use the multiplication key instead -Emphasise the conversion of answers into correct standard form eg 12×10^3	Indices Speed, distance, time Place value	HM 122, 123
24/1/2022		Revision/ **check out**	TBAT consolidate knowledge of numbers (block 6)			

		Rationale:				
	Block 7 Using percentages	**Check in** 1. FDP equivalence (R)	TBAT convert fluently between fractions, decimals and percentages	-Use bar models to illustrate building up to non-unit fractions such as ¾ or 3/5 -Keep practising key equivalences students should know including 1/3 and 1/10 -Emphasise the link between hundredths and percentages -Use a hundred square to show differences eg between 80% and 8% linking it to 0.8 and 0.08		HM 73, 74, 75, 76
		2. Calculate percentage increase and decrease (R)	TBAT calculate percentage increase and decrease	-Use bar models, starting with 100% each time, "what percentage will I have after the change?" -Use place value chart to support dividing by 100 to find multipliers -Look at questions in context so students can interpret discount and surcharge	Money	HM 90
		3. Express a change as a percentage (R)	TBAT express a change as a percentage	-Encourage students to express the change as a fraction first -Emphasise that students should compare change with the original value	Conversion of FDP	
		4. Solve reverse percentage problems	TBAT solve reverse percentage problems	-Start with "goal free" problems and pose the question "What percentage do I know?" -Use bar models to represent the situations -Give questions one sentence at a time to ease cognitive load -Explicitly model step-by-step solutions -Provide partially completed bar models to start and gradually remove this scaffold		HM 96
		5. Solve percentage problems (no cal) 6. Solve percentage problems (cal)	TBAT solve percentage problems with and without a calculator	-Focus on the decision making, "What do we know?" and "What can you find out?" -Give questions one sentence at a time to ease cognitive load -If students are unsure, replace difficult numbers with easier ones -Explicitly model step-by-step solutions		HM 98

		7. Repeated percentage change	TBAT find repeated percentage changes		Indices Depreciation Volume	HM 91, 92
		Revision/ **check out**	TBAT consolidate knowledge of using percentages (block 7)			
	Rationale:					
7/2/2022	**Block 8** Maths and money	**Check in** 1. Bills and bank statements	TBAT solve problems with bills and bank statements	-Start with simplified examples with less information and fewer values to find -Invest time to discussing unfamiliar vocabulary- credit/debit/balance -Use calculators to reduce cognitive load -Only use complex real life examples when students are more confident		HM 757, 758 Financial Statements
		2. Calculate simple interest	TBAT calculate simple interest	-Link back to previous learning -Start with simple percentage eg 5% before moving to more complex ones eg 1.3% -Encourage students to find the interest earned in one year and then multiply up rather than combining multiple steps	Decimals	HM 93
		3. Calculate compound interest	TBAT calculate compound interest	-Limit examples to two or three years with a constant percentage at first -Take a step-by-step approach and only move to x1.03^5 when confident -Challenge the misconception that 5% for two years is the same as 10%	Percentage increase/decrease	HM 94
		4. Value added tax	TBAT calculate value added tax VAT	-Revise calculator and non-calculator ways of finding a percentage -Bar models may be useful		
		5. Calculate wages and taxes	TBAT calculate wages and taxes	-Start with simplified problems where only one or two steps are needed to reach a solution -Ensure vocabulary is discussed and understood (salary, tax, hourly rate, piece-work)		HM 755, 756
		6. Exchange rates	TBAT calculate exchange rates	-Start with simple exchange rates eg £1=$2 and convert both ways	Decimals	HM 772

				-Always ask "Will the number os pounds/dollars/euros be greater than the number of…..?" -Encourage the use of estimation to check answers are sensible		
		7. Solve unit pricing problems	TBAT solve unit pricing problems	-Brainstorm what the possible units may be -Focus entirely on the unitary method, other method appear later in the year (ratio and proportion block)	Proportion	
		Revision/ **check out**	TBAT consolidate knowledge of maths and money (block 8)			
21/2/2022				**HALF TERM**		
	Rationale:					
28/2/2022	**Block 9** Deduction	**Check in** 1. Angles in parallel lines (R)	TBAT find missing angles within parallel lines	-Revise basic angle facts first -Provide stem sentences to support explanation eg "Angles…..and …..are equal because……." -Provide a list of key words -Use calculators to perform arithmetic and concentrate on reasoning	Basic angle lines	HM 481 Alternate 482 Co-interior 483 Corresponding
		2. Solve angle problems	TBAT solve angle problems	-Start with short chains -Provide partially completed solutions and gradually remove scaffold -Use minimally different example problems to make connections between examples		HM 488, 489
		3. Angle problems with algebra	TBAT solve angle problems with algebra	-Revise solving context free equations first -Use bar models/cups and counters -Encourage substitution to check answers	Solving equations using algebra Interior/exterior angles	HM 490, 491
		4. Conjectures with angles 5. Conjectures with shapes	TBAT test conjectures with angles and shapes	-Revisit types of angles first -Start with basic most familiar conjectures eg angles in triangle/ around a point -Reinforce parallel lines when appropriate		
		6. Constructions and	TBAT preform constructions and provide geometrical reasoning to all shapes		Perpendicular lines	

		geometrical reasoning				
		Revision/ **check out**	TBAT consolidate knowledge of deduction (block 9)			
	Rationale:					
	Block 10 Rotation and translation	**Check in** 1. Identify the order of rotational symmetry	TBAT identify the order of rotational symmetry	-Use tracing paper and relatively large shapes so rotation is clear -Distinguish between regular and irregular shapes -Emphasise that all shapes have order of rotational symmetry at least 1 -Revisit vocabulary like trapezium, rhombus etc		HM 828
		2. Compare rotational symmetry with line of symmetry	TBAT compare rotational symmetry with line of symmetry	-Model and encourage folding to check lines -Model using tracing paper -Link to familiar real-life objects such as road signs		HM 827
14/3/2022		3. Rotate a shape about a point on a shape 4. Rotate a shape about a point not on a shape	TBAT rotate a shape about a point on and not on a shape	-Model clockwise and anticlockwise on an analogue clock and compass to link to direction -Use "human geometry" and rotate students 90/180/270 degrees in both directions -Model using tracing paper -Include arrows and triangles so students don't gain misconceptions about squares	Area	
		5. Translate points and shapes by a vector	TBAT translate points and shapes by a vector	-Use single points rather than shapes to begin -Start describing translations in words and only change one dimension -Move to simple shapes and two dimensions when comfortable		HM 637, 638
		6. Compare rotation and reflection of shapes	TBAT compare rotation and reflection of shapes	-"What's the same, what's different?" approach -Work on both coordinate axes and unnumbered grids		

		7. Series of transformations	TBAT perform a series of transformations to any given shape			HM 650-654
		Revision/ **check out**	TBAT consolidate knowledge of rotation and translation (block 10)			
	Rationale:					
	Block 11 Pythagoras' Theorem	**Check in** 1. Square and square roots (R) 2. Identify the hypotenuse of right-angle triangles	TBAT identify the hypotenuse of right-angle triangles using square and square root knowledge	-Compare to square arrays of dots, noting that squares can have non-integer sides -Use calculators -Revise rounding to decimals places and significant figures -Emphasise the side opposite the right angle is always the longest and called the hypotenuse	Significant figures	HM 498
		3. Is a triangle right angled? 4. Calculate the hypotenuse of right angled triangles	TBAT calculate the hypotenuse of right angled triangles and determine if triangles are right-angled or not	-Use dynamic geometry scaffolding -Include sets like 0.9, 1.2 and 1.5 to avoid misconceptions that sides have to be integers	Area of triangles Rounding decimals	
		5. Calculate missing sides in right-angled triangles	TBAT calculate missing sides in right-angled triangles	-Provide partially completed solutions -Identify hypotenuse first -Include integer and non-integer answers with the use of calculators		HM 499
28/3/2022		6. Use Pythagoras on coordinate axes	TBAT use Pythagoras on coordinate axes	-Work in first quadrant initially -Model that triangles can be drawn above or below line segments	Coordinates Gradient Line graphs	HM 501, 502
		7. Explore proofs of Pythagoras' Theorem	TBAT explore proofs of Pythagoras' Theorem	-Formal proof not required so this step can be omitted if too challenging for students	Congruency	HM 497
		8. Pythagoras' theorem in 3D shapes	TBAT perform Pythagoras' theorem in 3D shapes			HM 505, 506, 507
		Revision/ **check out**	TBAT consolidate knowledge of Pythagoras' Theorem (block 11)			

		Revision blocks 6-11				
		Revision blocks 6-11				
		Spring assessment				
		Reflection				
11/4/2022			**EASTER HOLIDAYS**			
	Rationale:					
25/4/2022	**Block 12** Enlargement and similarity	**Check in** 1. Recognise enlargement and similarity 2. Enlarge a shape by a positive integer scale factor	TBAT enlarge a shape by a positive integer scale factor	-Use actual photos to make the need for equal scale factors in both directions clear -Start with obvious non-enlargements that don't need to be measured -Include examples of enlargement by a scale factor between 0 and 1 to address misconception of "enlargement means make bigger"	Ratio Coordinates	HM 642
		3. Enlarge a shape by a positive integer scale factor from a point 4. Enlarge a shape by a positive fractional scale factor	TBAT enlarge a shape by a positive integer and positive fractional scale factor from a point	-Start with rectangles then move to triangles -Use only whole number scale factors unless students are secure and can appreciate eg x2.5 -Use "counting squares" method with emphasise being on starting at the centre each time and multiplying the translation -Provide pre-drawn shapes with the centre of enlargement marked to reduce errors in copying	Fractions of amounts	HM 644
		5. Enlarge a shape by a negative scale factor	TBAT enlarge a shape by a negative scale factor		Negative numbers	HM 646, 647
		6. Work out missing sides and angles in similar shapes	TBAT work out missing sides and angles in similar shapes	-Include plenty of practice of finding missing angles to reinforce the idea that angles do not change -Encourage students to work systematically and create a list of steps for them to follow -Use calculators where necessary	Ratio	HM 608

		7. Solve similar triangle problems 8. Right angle triangle ratios	TBAT solve similar triangle problems using right angle triangle ratios			HM 611
		Revision/ **check out**	TBAT consolidate knowledge of enlargement and similarity (block 12)			
	Rationale: Step 6 best buys builds on strategies used earlier in "Maths and money" block					
	Block 13 Ratio and proportion problems	**Check in** 1. Solve problems with direct proportion (R) 2. Direct proportion and conversation graphs (R)	TBAT solve problems with direct proportion	-Use double number lines to represent the relationships. Provide partially filled copies if needed -Emphasise the horizontal relationships using both multiplication and division to demonstrate efficiency -Derive the graphs and make explicit links between: table of values, coordinates and the straight line on coordinate axes -Discuss the importance of (0,0) for direct proportion graphs	Money Ratio Unitary method	HM 339, 340, 341
		3. Solve problems with inverse proportion 4. Graphs of inverse relationships	TBAT solve problems with inverse proportion	-Build up solutions by looking at 1 eg "If it takes 10 people 2 hours, how long would it take 1 person?" -Encourage students to think "Will 1 person take more or less time? What about 20 people?		HM 342
9/5/2022		5. Solve ratio problems given the whole or part (R)	TBAT solve ratio problems given the whole or part	-Use bar models, provide partially filled ones to save time -Allow calculator to move the emphasis onto choosing the correct operation rather than the arithmetic skills -Provide practice with non-calculator methods only once methods are understood	Fractions, decimals, percentages	
		6. Solve best buy problems	TBAT solve best buy problems	-Brainstorm each question with possible units and find the cost of 1 item (unitary method)	Unitary method Exchange rates Direct proportion	HM 763-772

		7. Solve problems with ratio and algebra	TBAT solve problems with ratio and algebra		Ratio as fractions Expanding brackets Simplifying/collecting like terms	
		Revision/ **check out**	TBAT consolidate knowledge of proportion and ratio (block 13)			
	Rationale:					
	Block 14 Rates	**Check in** 1. Speed, distance, time problems (no cal) 2. Speed, distance, time problems (cal)	TBAT solve speed, distance, time problems with and without a calculator	-Use double number lines to emphasise the meaning of per in miles per hour -Use bar models to support calculations -Check students are comfortable using the formulae with straightforward numbers before moving to decimals -Work on changing between minutes and hours to address misconceptions eg 30 minutes = 0.3 hours	Rounding Inverse operations	HM 716, 717
		3. Use distance-time graphs	TBAT use distance-time graphs	-Emphasise the slope of the graph indicates the speed and not the direction	Gradient Area of triangles	HM 880, 881
		4. Density, mass and volume	TBAT complete density, mass and volume calculations	-Make links to same model as speed, distance, time -If including questions where the volume needs to be found, revisit this formulae first	Converting units Rearranging formulae Substitution	HM 725, 726
23/5/2022		5. Solve flow problems and their graphs	TBAT solve flow problems and their graphs	-Start with a pair of simple graphs that show eg 10 litres in 2 minutes and 12 litres in 3 minutes, finding the rate per minute for each and making the link to the gradient of the line	Volume of prisms Straight line graphs	
		6. Rates of change and their units	TBAT understand rates of change and their units	-Link to familiar examples from earlier including currency conversions and the idea of "exchange rates" -Encourage students to be realistic and whether the calculation should use multiplication or division	Conversions	
		7. Convert compound units	TBAT convert between different compound units			

		Revision/ **check out**	TBAT consolidate knowledge of rates (block 14)			
30/5/2022			**HALF TERM**			
	Rationale:					
6/6/2022	**Block 15** Probability (Higher steps also taught at foundation)	**Check in** 1. Single event probability (R)	TBAT find the probability of a single event	-Revise fraction equivalence and arithmetic before starting topic -Discuss when it is and isn't appropriate to assume events are equally likely -Focus on the understanding of key word eg bias	Fraction, decimal, percentage equivalence	HM 351, 352
		2. Relative frequency – including convergence	TBAT understand and calculate relative frequencies	-Practical experiments should be conducted to provide students with concrete foundations -Use of computer generated results could also illustrate experiments will a lot of trials	Coordinates Plotting graphs	HM 357
		3. Expected outcomes	TBAT list all expected outcomes of any given event	-Students need to be aware that the expected number of times an outcome will occur is a long-term average rather than a prediction	Estimation	
		4. Independent events	TBAT calculate the probability of an independent event	-Students need to be careful not to confuse independent (outcomes do not affect each other) with mutually exclusive (cannot occur together)	Two way tables	HM 360
		5. Use tree diagrams	TBAT use and complete tree diagrams with fractions and decimals		Product rule	HM 361, 362
		6. Use tree diagrams without replacement	TBAT use and complete tree diagrams in conditional probability (without replacement)			HM 364, 365
		7. Use diagrams to work out probabilities	TBAT use diagrams to work out probabilities	-Provide support in constructing sample space diagrams -Revise how to construct two-way tables and Venn diagrams	Factors, multiples, primes Two way tables	
		Revision/ **check out**	TBAT consolidate knowledge of probability (block 15)			

	Rationale:					
20/6/2022	**Block 16** Algebraic representation (Higher steps also taught at foundation)	**Check in** 1. Draw and interpret quadratic graphs	TBAT draw and interpret quadratic graphs	-Revise substitution of negative numbers -Encourage use of calculators to avoid cognitive load -Use dynamic software to support the drawing of parabolas	Table of values Coordinates Symmetry Square numbers	HM 251
		2. Interpret graphs including reciprocals	TBAT interpret graphs including reciprocals	-Encourage students to use rulers to help them draw lines and read off values in both directions		HM 300
		3. Investigate graphs of simultaneous equations	TBAT investigate the graphs of simultaneous equations		Solving equations Y intercepts	HM 246
		4. Represent inequalities	TBAT represent inequalities	-Start and focus on one variable to shade the region of -Revise forming and solving inequalities if needed	Greater than, less than	HM 266
		Revision/ **check out**	TBAT consolidate knowledge of algebraic representations (block 16)			
		Revision blocks 12-16				
		Revision blocks 12-16				
		Revision blocks 12-16				
4/7/2022		Revision blocks 12-16				
		Summer assessment				
		Reflection				
		Consolidation of KS3				
		Consolidation of KS3				
		Consolidation of KS3				

		Consolidation of KS3				
		Consolidation of KS3				
		SUMMER HOLIDAYS				