		St	age 7 202	2-23		
	Autum	n Term	Spring Term		Summer Term	
	1	2	1	2	1	2
Key Concepts	1A Numbers & the number system. 1B Checking and Approximatin g 2C Calculating	2D Exploring FDP 2E Calculating FDP 2F Manipulating Algebra	3G Solving equations & Inequalities 3H Probability 3I Sequences 3J Investigating Angles	4K Proportional Reasoning 4L Transformatio ns 5M Statistics- Averages	5N Statistics- Graphs 5O Measuring Space 6P Calculating Space	6Q Visualising and Constructing
Knowledge & Understandi ng <i>(National</i> <i>Curriculum)</i>	 1A Recall prime numbers up to 100 N30a Know how to test if a number up to 150 is prime N30a Know the meaning of 'highest common factor' and 'lowest common multiple' N31a, N31b <u>38-41</u> Recognise when 	 2D Write one quantity as a fraction of another where the fraction is less than 1 R3 Write one quantity as a fraction of another where the fraction is greater than 1 R3 Write a percentage as a fraction N32 73- 	 3G Solve two-step equations (including the use of brackets) when the solution is a fraction A12 100-101 Solve three-step equations (including the use of brackets) when the solution is a whole number A19a 101-102 	 4K Describe a comparison of measurements or objects using the language 'a to b' <u>63</u> Describe a comparison of measurements or objects using ratio notation a:b <u>63-64</u> Use ratio notation to describe a comparison of 	 5N Know the meaning of categorical data Know the meaning of discrete data 63 <u>310-311</u> Construct and interpret comparative bar charts 15 <u>328-329</u> Interpret pie charts and know their appropriate use 128a <u>332-336</u> Construct pie 	 6Q Know the meaning of faces, edges and vertices <u>261</u> Use notation for parallel lines Know the meaning of 'perpendicular' and identify perpendicular lines Know the meaning of 'regular' polygons 10 <u>180</u>

 a problem involves using the highest common factor of two numbers N31a 40-41 Recognise when a problem involves using the lowest common multiple of two numbers N31b 39, 41 Understand the use of notation for powers N25 Know the meaning of the square root symbol (√) N25 27 Use a scientific calculator to calculate powers and 	 <u>75, 78</u> Write a quantity as a percentage of another <u>73-</u><u>75</u> 2E Apply addition to proper fractions, improper fractions and mixed numbers N35, N36, N41 <u>44-45, 48-51</u> Apply subtraction to proper fractions, improper fractions and mixed numbers N35, N36, N41 <u>44-45, 48-51</u> Multiply proper and improper fractions N35, 	 Solve three-step equations (including the use of brackets) when the solution is a fraction A19a 101-102 Check the solution to an equation by substitution Solve linear equations with the unknown on one side when the solution is a negative number A12 101-102 Solve linear equations with the unknown on one side when the solution is a negative number A12 101-102 Solve linear equations with the unknown on both sides when the solution is a whole number A19b 102-104 	 more than two measurements or objects <u>63-64</u> Convert between different units of measurement State a ratio of measurements in the same units 38 <u>63-64</u> Simplify a ratio by cancelling common factors R5a <u>63-64</u> Identify when a ratio is written in its lowest terms R5a <u>63-64</u> Find the value of a 'unit' in a division in a ratio problem <u>65</u> Divide a quantity in two parts in a given part:part ratio R5b 70-71 	charts when the total frequency is not a factor of 360 128a <u>332-336</u> Choose appropriate graphs or charts to represent data Construct and interpret vertical line charts 64 Plot a scatter diagram of bivariate data 129 <u>338-341</u> Understand the meaning of 'correlation' 129 <u>338-341</u> Interpret a scatter diagram using understanding of correlation 129 <u>338- 341</u> 50	 Identify line and rotational symmetry in polygons 11 <u>184-186</u> Use AB notation for describing lengths Use ∠ABC notation for describing angles Use ruler and protractor to construct triangles from written descriptions 47 <u>232-235</u> Use ruler and compasses to construct triangles when all three sides known 147 <u>232-235</u>
symbol (√) N25 <u>27</u> • Use a scientific calculator to	mixed numbers N35, N36, N41 <u>44-45, 48-51</u> Multiply proper and improper	equations with the unknown on both sides when the solution is a	 division in a ratio problem <u>65</u> Divide a quantity in two parts in a 	diagram using understanding of correlation 129 <u>338-</u> <u>341</u>	construct triangles when all three sides
 Powers and roots N44 <u>28</u> Make the connection between squares and square roots (and cubes and 	 N42a <u>51-53</u> Multiply mixed numbers N35, N42a <u>53-54</u> Apply division to improper fractions and 	 Solve linear equations with the unknown on both sides when the solution is a fraction A19b 102-104 	 Divide a quantity in two parts in a given part:whole ratio R5b_69 Express correctly the solution to a division in a ratio 	 Convert fluently between metric units of length R2 , 112 <u>192-194</u> Convert fluently between metric units of mass 	

cube roots) N25 <u>26-27</u> Identify the first 10 triangular numbers A22 Recall the first 15 square numbers A22 <u>26</u> Recall the first 5 cube numbers	 mixed numbers N35, N42b <u>54-56</u> Use calculators to find a percentage of an amount using multiplicative methods N24b Identify the multiplier for a 	 Solve linear equations with the unknown on both sides when the solution is a negative number A19b_102-104 Solve linear equations with the unknown on both 	problem R5b_67-69 4Llength R2, 112 192-194• Write the equation of a line parallel to the x- axis or the y-axis• Convert fluently between metric units of volume / capacity length R2 , 112 192-194• Draw a line parallel to the x-• Convert fluently between units of parallel to the x-• Draw a line parallel to the x-• Convert fluently between units of parallel to the x-	
 patterns to solve problems <u>129</u> 1B Approximate by rounding to any number of decimal places N27b <u>19-20</u> Know how to identify the first significant figure in any number N38 <u>21-22</u> Approximate by rounding to the first significant figure in any number N38 <u>21- 22</u> Understand 	 decrease R9b <u>81-82</u> Use calculators to increase (decrease) an amount by a percentage using multiplicative methods R9b <u>80-82</u> Compare two quantities using percentages N39b <u>83</u> Know that percentage change = actual change ÷ original amount 109 Calculate the 	brackets A19b <u>102-</u> <u>104</u> 3H • Know that probability is a way of measuring likeliness P1 <u>342</u> • Know and use the vocabulary of probability P1 <u>342-344</u> • Understand the use of the 0-1 scale to measure probability P1 <u>342-344</u> • Assess likeliness and place events on a probability scale P1 342-344	 <u>136-137</u> Identify the lines A5 y = x and y = - x Draw the lines A5 y = x and y = -x Carry out a reflection in a diagonal mirror line (45° from horizontal)G4a, G4b <u>283-286</u> Find and name the equation of the mirror line for a given reflection <u>283-</u> <u>286</u> Describe a translation as a 2D vector G5 Solve practical problems that involve converting between units length R2, 112 <u>192-194</u> State conclusions clearly using the units correctly Convert between Imperial units; e.g. feet and inches, pounds and ounces, pints and gallons <u>197-199</u> Solve problems involving converting between measures <u>197-199</u> 	

 hagintude of the solution to a (decimal) calculation Estimate calculations by rounding numbers to one significant figure N38 <u>23-24</u> Use cancellation to simplify calculations Use inverse operations to check solutions to calculations 	change in a given situation, including percentage increase / decrease 109 <u>84-85</u> 2F Know how to write products algebraically Use fractions when working in algebraic situations Identify common factors (numerical and algebraic) of terms in an expression A9 Factorise an expression by taking out common factors A9 <u>95-96</u> Simplify an expression involving terms	 List all the outcomes for an experiment P2a <u>348-350</u> Identify equally likely outcomes P2a <u>344-345</u> Work out theoretical probabilities for events with equally likely outcomes 59 <u>344-345</u> Know how to represent a probability Recognise when it is not possible to work out a theoretical probability for an event Know that the sum of probabilities for all outcomes is 1 Apply the fact that the sum of probabilities for all outcomes is 1 P1 <u>346-347</u> 	 <u>290-293</u> Carry out a reflection in a given vertical or horizontal mirror line <u>283-286</u> Carry out a translation G5 <u>290-293</u> Understand the concept and language of rotations G6 <u>287-</u> <u>290</u> Carry out a rotation using a given angle, direction and centre of rotation G6 <u>287-290</u> Describe a rotation using mathematical language G6 <u>287-</u> <u>290</u> Calculate the mean from a frequency table 130a <u>323-325</u> Find the mode from a frequency table 130a <u>323-</u> 	using the correct notation and units <u>197-199</u> • Know that one inch is roughly equivalent to 2.5 cm <u>197-199</u> • Know that one foot is roughly equivalent to 30 cm <u>197-199</u> • Know that one kilogram is roughly equivalent to 2.2 lb <u>197-199</u> • Know that one pint is roughly equivalent to 550 ml <u>197-199</u> Use rough equivalents between metric and Imperial units when solving problems <u>197-199</u> 6P • Understand how to estimate the area of irregular shapes • Estimate the area of irregular shapes bounded by
--	--	--	---	--

N28b <u>11-13</u>		31	325	straight lines or
Use knowle	0	• Use a term-to-	• Find the median	that include
of place val	·	term rule to	from a frequency	curved lines
divide a dec	Ĵ,	generate a non-	table 130a <u>323-</u>	Recognise that the
N29b <u>11</u>	single brackets	linear sequence	<u>325</u>	value of the
Use knowle	•	37 <u>127-129</u>	 Understand the 	perimeter can
of place val		• Find the term-to-	range as a	equal the value of
divide by a	quadratic brackets	term rule for a	measure of	area <u>244-248</u>
decimal N2	9b_ A18 <u>96-97</u>	sequence 37 <u>127-</u>	spread (or	Use standard
<u>14 - 15</u>		<u>128</u>	consistency) 62	formulae for area
Use knowle	edge	Solve problems	<u>323-325</u>	and volume G9 ,
of inverse		involving the	 Analyse and 	G20a,G20b, G20c,
operations		term-to-term	compare sets of	G20d, G24, G21a,
when dividi	-	rule for a	data <u>325-326</u>	G25a <u>244-248,</u>
with decima		sequence 37 <u>127-</u>	Appreciate the	<u>271-272</u>
Be fluent at		<u>128</u>	limitations of	Find missing
multiplying		Solve problems	different statistics	lengths in 2D
three-digit	ora	involving the	(mean, median,	shapes when the
two-digit		term-to-term	mode, range) 62	area is known
number by	а	rule for a non-		Know that the
two-digit		numerical		area of a
number N2	8a <u>4-</u>	sequence 37 <u>129</u>		trapezium is given
5		• Find the position-		by the formula
Be fluent w	hen	to-term rule for a		area = $\frac{1}{2} \times (a + b)$
using the		given sequence		\times h = $\left(\frac{a+b}{2}\right)h$ =
method of s		103 <u>130-133</u>		
division N1		Use algebra to		$\frac{(a+b)h}{2}$ G20d
Know the o		describe the		<u> </u>
of operation		position-to-term rule of a linear		Calculate the area
for the four				of a trapezium
operations	N2U	sequence (the nth		G20d 249-248
<u>15-16</u>		term) 103 <u>130-133</u>		Understand the
Use bracket	ts in			

problems	3J	meaning of
involving the	Identify fluently	surface area
order of	angles at a point,	• Find the surface
operations N20	angles at a point	area of cuboids
15-16	on a line and	(including cubes)
Add or subtract	vertically	when lengths are
from a negative	opposite G10a ,	known G21b <u>275-</u>
number N19a <u>1-</u>	G18 <u>168-172</u>	276
2	Identify known	Find missing
Add (or	angle facts in	lengths in 3D
subtract) a	more complex	shapes when the
negative	geometrical	volume or surface
number to	diagrams G18	area is known
(from) a positive	<u>168-172</u>	Know the
number N19a _2	Use knowledge	vocabulary of
Add (or	of angles to	circles
subtract) a	calculate missing	Know that the
negative	angles in	number π (pi) =
number to	geometrical	3.1415926535
(from) a	diagrams <u>168-</u>	 Recall π to two
negative	172	decimal places
number N19a 2	Find the missing	Know the formula
Multiply with	angle in an	circumference of a
negative	isosceles triangle	circle = $2\pi r = \pi d$
numbers N19b	when only one	G22 a <u>252-253</u>
<u>2-3</u>	angle is known	Calculate the
Divide with	G17 <u>168-172</u>	circumference of a
negative	Find missing	circle when radius
numbers N19b	angles in	(diameter) is given
<u>2-3</u>	isosceles	G22 a <u>252-253</u>
	triangles G17	Calculate the
	<u>168-172</u>	perimeter of
	Explain reasoning	composite shapes

			 using vocabulary of angles G10a <u>168-172</u> Identify alternate angles and know that they are equal G18 <u>173</u> Identify corresponding angles and know that they are equal G18 <u>174</u> Use knowledge of alternate and corresponding angles to calculate missing angles in geometrical diagrams G18 <u>174-</u> <u>175</u> 		that include sections of a circle G22a 253-255 • Know the formula area of a circle = πr^2 Calculate the area of a circle when radius (diameter) is given G22b 255-257	
Assessment	Teacher/Ass. Test	7.1 EXAM Unit tests	<u>175</u> Teacher/Ass. Test	7.2 EXAM Unit tests	Teacher/Ass. Test	7.3 EXAM Unit tests
	Unit tests		Unit tests		Unit tests	

	um Area: Maths		
Subject	:		
Year	Basic	Clear	Detailed
Group	(Lower Ability End Points)	(Middle Ability End Points)	(Higher Ability End Points)
7	Pupils use mathematics as an integral part of classroom activities. They represent their work with objects or pictures and discuss it. They	Pupils develop their own strategies for solving problems and use these strategies both in working within mathematics and in applying	Pupils carry out substantial tasks and solve quite complex problems by independently and systematically breaking them down into

Curricul	lum Area: Maths		
Subject	:		
Year Group	Basic (Lower Ability End Points)	Clear (Middle Ability End Points)	Detailed (Higher Ability End Points)
	recognise and use a simple pattern or relationship.	mathematics to practical contexts. When solving problems, with or without ICT, they check their results are reasonable by considering the context. They look for patterns and relationships, presenting information and results in a clear and organised way, using ICT appropriately. They search for a solution by trying out ideas of their own.	smaller, more manageable tasks. They interpret, discuss and synthesise information presented in a variety of mathematical forms relating findings to the original context. Their written and spoken language explains and informs their use of diagrams. They begin to give mathematical justifications, making connections between the current situation and situations they have encountered before
8	Pupils select the mathematics they use in some classroom activities. They discuss their work using mathematical language and are beginning to represent it using symbols and simple diagrams. They explain why an answer is correct.	In order to explore mathematical situations, carry out tasks or tackle problems, pupils identify the mathematical aspects and obtain necessary information. They calculate accurately, using ICT where appropriate. They check their working and results, considering whether these are sensible. They show understanding of situations by describing them mathematically using symbols, words and diagrams. They draw simple conclusions of their own and explain their reasoning.	Starting from problems or contexts that have been presented to them, pupils explore the effects of varying values and look for invariance in models and representations, working with and without ICT. They progressively refine or extend the mathematics used, giving reasons for their choice of mathematical presentation and explaining features they have selected. They justify their generalisations, arguments or solutions, looking for equivalence to different problems with similar structures. They appreciate the difference between mathematical explanation and experimental evidence.
9	Pupils try different approaches and find ways of overcoming difficulties that arise when they	Pupils carry out substantial tasks and solve quite complex problems by independently and	Pupils develop and follow alternative approaches. They compare and evaluate

Subject	:		
Year Group	Basic (Lower Ability End Points)	Clear (Middle Ability End Points)	Detailed (Higher Ability End Points)
	are solving problems. They are beginning to organise their work and check results. Pupils discuss their mathematical work and are beginning to explain their thinking. They use and interpret mathematical symbols and diagrams. Pupils show that they understand a general statement by finding particular examples that match it.	systematically breaking them down into smaller, more manageable tasks. They interpret, discuss and synthesise information presented in a variety of mathematical forms, relating findings to the original context. Their written and spoken language explains and informs their use of diagrams. They begin to give mathematical justifications, making connections between the current situation and situations they have encountered before.	representations of a situation, introducing and using a range of mathematical techniques. They reflect on their own lines of enquiry when exploring mathematical tasks. They communicate mathematical or statistical meaning to different audiences through precise and consistent use of symbols that is sustained throughout the work. They examine generalisations or solutions reached in an activity and make further progress in the activity as a result. They comment constructively on the reasoning and logic, the process employed and the results obtained.
10	Pupils develop their own strategies for solving problems and use these strategies both in working within mathematics and in applying mathematics to practical contexts. When solving problems, with or without ICT, they check their results are reasonable by considering the context. They look for patterns and relationships, presenting information and results in a clear and organised way, using ICT appropriately. They search for a solution by trying out ideas of their own.	Starting from problems or contexts that have been presented to them, pupils explore the effects of varying values and look for invariance in models and representations, working with and without ICT. They progressively refine or extend the mathematics used, giving reasons for their choice of mathematical presentation and explaining features they have selected. They justify their generalisations, arguments or solutions, looking for equivalence to different problems with similar structures. They appreciate the difference between mathematical explanation and experimental evidence.	Pupils critically examine the strategies adopted when investigating within mathematics itself or when using mathematics to analyse tasks. They explain why different strategies were used, considering the elegance and efficiency of alternative lines of enquiry or procedures. They apply the mathematics they know in a wide range of familiar and unfamiliar contexts. They use mathematical language and symbols effectively in presenting a convincing, reasoned argument. Their reports include mathematical justifications, distinguishing between evidence and proof and explaining

Subject:					
Year Group	Basic (Lower Ability End Points)	Clear (Middle Ability End Points)	Detailed (Higher Ability End Points) their solutions to problems involving a number of features or variables		
11	In order to explore mathematical situations, carry out tasks or tackle problems, pupils identify the mathematical aspects and obtain necessary information. They calculate accurately, using ICT where appropriate. They check their working and results, considering whether these are sensible. They show understanding of situations by describing them mathematically using symbols, words and diagrams. They draw simple conclusions of their own and explain their reasoning.	Pupils develop and follow alternative approaches. They compare and evaluate representations of a situation, introducing and using a range of mathematical techniques. They reflect on their own lines of enquiry when exploring mathematical tasks. They communicate mathematical or statistical meaning to different audiences through precise and consistent use of symbols that is sustained throughout the work. They examine generalisations or solutions reached in an activity and make further progress in the activity as a result. They comment constructively on the reasoning and logic, the process employed and the results obtained.	Pupils perform procedures accurately. They interpret, communicate complex information accurately and make deductions and inferences and draw conclusions. Pupils can construct substantial chains of reasoning, including convincing arguments and formal proofs. They generate efficient strategies to solve complex mathematical and non- mathematical problems by translating them into a series of mathematical processes. Pupi make and use connections, which may not be immediately obvious, between different part of mathematics and interpret results in the context of the given problem. They critically evaluate methods, arguments, results and the assumptions made.		

LITERACY

Pupils will develop their spelling of key mathematical words. This will be monitored using spelling tests at the start and end of each unit. This will be SPAG marked. Pupils will be given opportunities to write in sentences and paragraphs when suited to the topic.

Why this? Mathematic	is an interconnected subject in which pupils need to be able to move fluently between
----------------------	---

Why now?	representations of mathematical ideas. The programme of study for key stage 3 is organised into apparently distinct domains, but pupils should build on key stage 2 and connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge in science, geography, computing and other subjects. The structure is designed to bridge between KS2 and KS4, building both within and between key topic areas. The structure also builds the complexity levels within topics and gives a greater variation in the challenge given to pupils.
Skills &	Resilience
Characteristi cs	Pupils will increase their resilience during the course through learning new concepts, using prior knowledge to develop mathematical fluency and applying skills to a variety of situations and problems. Pupils will be challenged in all lessons and will show that they have learned from mistakes through a variety of tasks including connect exercises. The challenge activities will have the aim of developing both skills and high aspirations in both this subject and life beyond. Resilience will also be developed within the Key maths skills below (fluency, reasoning and problem solving).
	Collaboration Pupils will be given the opportunity to work together to develop and share their ideas on topics, discuss misconceptions and how these topics can be used in real-life situations.
	Creativity Pupils will develop creativity through a variety of problem solving activities within each topic, working on independent tasks beyond the classroom such as Mangahigh activities, and apply the key skills (fluency, reasoning and problem solving).
	Skills Builder
	COMMUNICATION = Listening & Speaking Pupils are expected to actively listen so that they can follow instructions and pick out misconceptions. (LISTENING) CREATIVE PROBLEM SOLVING = Problem Solving & Creativity Problem solving is an important part of Mathematics and ensures that they develop their mathematical thinking and helps build resilience. (PROBLEM SOLVING)

SELF-MANAGEMENT: Staying Positive & Aiming High All pupils attempt Bronze/Silver/Gold tasks and choose their starting point and aim for one or two steps of progress within each lesson. (AIMING HIGH) COLLABORATION: Leadership & Teamwork Pupils are expected to collaborate on many tasks, supporting each other to help all to progress. (TEAMWORK)
Develop fluency
number system and place value to include decimals, fractions, powers and roots
Select and use appropriate calculation strategies to solve increasingly complex problems
Quse algebra to generalise the structure of arithmetic, including to formulate mathematical relationships
Substitute values in expressions, rearrange and simplify expressions, and solve equations
Cmove freely between different numerical, algebraic, graphical and diagrammatic representations [for example, equivalent fractions, fractions and decimals, and equations and graphs]
Carteria develop algebraic and graphical fluency, including understanding linear and simple quadratic functions Use language and properties precisely to analyse numbers, algebraic expressions, 2-Dand 3-D shapes, probability and statistics.
Reason mathematically
Dextend their understanding of the number system; make connections between number relationships, and their algebraic and graphical representations
Pextend and formalise their knowledge of ratio and proportion in working with measures and geometry, and in formulating proportional relations algebraically
Didentify variables and express relations between variables algebraically and graphically
Cmake and test conjectures about patterns and relationships; look for proofs or counter- examples
Degin to reason deductively in geometry, number and algebra, including using geometrical constructions
Dinterpret when the structure of a numerical problem requires additive, multiplicative or proportional reasoning

	Cexplore what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally.
	Solve problems
	develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics
	Degin to model situations mathematically and express the results using a range of formal mathematical representations
	Select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems.
Aspirations & Careers	All pupils should be numerate and able to use mathematics at both work and in everyday life beyond school. Mathematics is fundamental to future success and closely linked with financial success. It enhances their ability to infer, problem solve, think logically, spot patterns as well as navigate through their chosen career with a well-equipped vocabulary. Furthermore, mathematics empowers our pupils to operate in the modern world. CDI: 1, 11
	CEIAG AMSP days Careers Fairs Career themed lessons Finance lessons (CDI: 13) Cultural Capital Maths challenges Mangahigh challenges Mathematics in the real world Organising trips, days out and other events Extracurricular Stretch and challenge club

Chess & games club
Homework club