Year Plan – Book 3.2 for Year 9 middle set

Subject	Mathematics	**Key Stage**	3	**Year**	9	**Course**	N/A

Time period	**Term 6**	**Title**	**Maths Frameworking Pupil Book 3.2** **Unit 1 Percentages** **Unit 2 Equations and formulae** **Unit 3 Polygons**
Number of lessons	Unit 1 Percentages (5 hours) Unit 2 Equations and formulae (6 hours) Unit 3 Polygons (4 hours)	ICT links / tasks	
Literacy links / tasks		Numeracy links / tasks	
What should pupils know already?	**Unit 1 Percentages** Although pupils have met percentages before there are some important and quite challenging concepts in this chapter. The ideas of percentages as a multiplier and the use of multiplicative reasoning are very important to pupils' confidence and fluency when working with percentages. Therefore, while you may be able to leave out some of the earlier questions in each exercise, be careful not leave out too much or move on too fast. This challenge gives pupils the opportunity to extend their learning by making links to other areas of mathematics including the work in Chapter 5 (Applications of graphs). **Unit 2 Equations and Formulae** Much of this chapter will be unfamiliar to pupils. However, some pupils may be familiar with expanding brackets. Check that all pupils can expand brackets with negative coefficients fluently before moving on to the rest of the chapter. If pupils grasp the concepts quickly they can move on to the more challenging questions that are towards the	What will pupils learn?	**Unit 1 Percentages** 1.1 Simple interest 1.2 Percentage increase and decrease 1.3 Calculating the original value 1.4 Using percentages **Review Questions and challenge exponential growth** **Unit 2 Equations and formulae** 2.1 Multiplying out brackets 2.2 Factorising algebraic expressions 2.3 Equations with brackets 2.4 Equations with fractions 2.5 Rearranging formulae **Review Questions and Investigation body mass index** **Unit 3 Polygons** 3.1 Angles in polygons 3.2 Constructions 3.3 Angles in regular polygons

Year Plan – Book 3.2 for Year 9 middle set

	end of each exercise in the Pupil Book. This investigation will help to embed the concepts and skills learned in this chapter. **Unit 3 Polygons** The material in this chapter is mainly new material. However, you could use one or two examples as a class discussion and then focus on the PS and MR questions in each exercise of the Pupil Book plus the activities at the end of each lesson. In this way, you could combine Lesson 1.1 and Lesson 1.2. This activity is designed to give the class the opportunity to apply what they have learnt to a familiar real-life context. Pupils will need to apply their knowledge of angles in polygons, as well as to more complex multi-step constructions.		3.4 Regular polygons and tessellations **Review Questions and Activity Garden design**
How will pupils be assessed?	Units 1 and 2 assessment on Collins Connect	What are the assessment criteria?	

Time period	**Term 1**	**Title**	**Maths Frameworking Pupil Book 3.2**

Year Plan – Book 3.2 for Year 9 middle set

			Unit 4 Using data **Unit 5 Applications of graphs** **Unit 6 Pythagoras's theorem**
Number of lessons	Unit 4 Using data (5 hours) Unit 5 Applications of graphs (4 hours) Unit 6 Pythagoras's theorem (4 hours)	ICT links / tasks	
Literacy links / tasks		Numeracy links / tasks	
What should pupils know already?	Unit 4 Using data Much of the material in the lessons of this chapter will be new to pupils. Lesson 4.3 and Lesson 4.4 could, however, be combined. Make certain that pupils have a good grasp of correlation and time series before moving on. This challenge does not intend to make any judgement values of the country or countries concerned. Instead, this activity has been devised to allow pupils to find what the statistics may suggest; in other words, that economic growth can affect the amount of deforestation. **Unit 5 Application of Graphs** This chapter is mainly new material, so work through each lesson thoroughly. This activity uses the context of mobile phones, a topic that will be very familiar to pupil. However, pupils may not have thought of using graphs to make the best decisions about which tariff to buy. **Unit 6 Pythagoras's Theorem** This whole chapter will be new to pupils. However, it is possible to combine Lesson 6.2 and Lesson 6.3. More able pupils could then move on rapidly to Lesson 6.4 if they fully grasp the concepts and methods taught in this chapter. This practical activity will help to deepen pupils' understanding of Pythagoras' theorem.	What will pupils learn?	**Unit 4 Using data** 4.1 Using data 4.2 Time-series graphs 4.3 Two-way tables 4.4 Comparing two or more sets of data 4.5 Statistical Investigations Review Questions and Challenge – Rain Forest deforestation **Unit 5 Application of Graphs** 5.1 Step graphs 5.2 Time series 5.3 Exponential growth graphs Review and Problem solving mobile phone tariffs **Unit 6 Pythagoras's Theorem** 6.1 Introduction to Pythagoras's theorem 6.2 Calculating the length of the hypotenuse 6.3 Using Pythagoras's theorem to solve problems Review and Activity – Pythagoras's theorem
How will pupils be	Units 3 – 5 assessment on Collins Connect	What are the assessment	

Year Plan – Book 3.2 for Year 9 middle set

assessed?		criteria?	

Year Plan – Book 3.2 for Year 9 middle set

Time period	Term 2	Title	Maths Frameworking Pupil Book 3.2 Unit 7 Fractions Unit 8 Algebra Unit 9 Decimal Numbers
Number of lessons	Unit 7 Fractions (4 hours) Unit 8 Algebra (4 hours) Unit 9 Decimal Numbers (4 hours)	ICT links / tasks	
Literacy links / tasks		Numeracy links / tasks	
What should pupils know already?	**Unit 7 Fractions** The material in Lesson 7.1 should be familiar to pupils. Check by working through some examples and then move on to Lesson 7.2. Lessons 7.3 and 7.4 are new but build on concepts that pupils have already met. You could combine these and focus on the more extended questions. In this investigation, pupils are required to apply their understanding of fractions to a more complex problem. Pupils need to work methodically and be able to explain their solutions. **Unit 8 Algebra** All the work in this chapter will be new to pupils. However, you could fast-track those pupils who grasp the material quickly to the more challenging questions at the end of each exercise in the Pupil Book. This challenge activity requires pupils to apply their learning from this chapter in a less familiar practical context. **Unit 9 Decimal Numbers** The content of Lesson 9.1 should be familiar to pupils. Check understanding then move on to Lesson 9.2 on standard form. You could combine Lessons 9.3 and 9.4 by	What will pupils learn?	**Unit 7 Fractions** 7.1 Adding and subtracting fractions 7.2 Multiplying fractions 7.3 Multiplying mixed numbers 7.4 Dividing fractions and negative numbers Review Questions and Investigation Fractions from one to six **Unit 8 Algebra** 8.1 More about brackets 8.2 Factorising expressions containing powers 8.3 Expanding the product of two brackets Review questions and Challenge – Graphs from expressions **Unit 9 Decimal Numbers** 9.1 Powers of 10 9.2 Standard form 9.3 Rounding appropriately 9.4 Mental calculations 9.5 Solving problems Review Questions and Mathematical reasoning paper

Year Plan – Book 3.2 for Year 9 middle set

	working through the examples and asking pupils to answer the MR and PS questions in Exercise 9C and 9D and/or the activity and investigation at the end of each exercise, respectively. Then move on to Lesson 9.5. All the information is provided but it is quite complex. Pupils will need to read the questions very carefully to decide which information they need and what mathematical skills to use in each case.		
How will pupils be assessed?	Units 6 – 8 assessment from Collins Connect	What are the assessment criteria?	

Year Plan – Book 3.2 for Year 9 middle set

Time period	Term 3	Title	Maths Frameworking Pupil Book 3.2 Unit 10 Prisms and cylinders Unit 11 Solving equations graphically Unit 12 Compound units
Number of lessons	Unit 10 Prisms and cylinders (5 hours) Unit 11 Solving equations graphically (5 hours) Unit 12 Compound units (4 hours)	ICT links / tasks	
Literacy links / tasks		Numeracy links / tasks	
What should pupils know already?	**Unit 10 Prisms and cylinders** The material in this chapter will be new to pupils. However, you could combine Lessons 10.2 and 10.3 and Lessons 10.4 and 10.5 while teaching. This problem-solving activity will help pupils to make their learning relevant, by applying it to a real-life situation. **Unit 11 Solving equations graphically** The material in this chapter is complex and is likely to be new to many pupils. If pupils are confident and fluent with linear graphs and rearranging equations you could move straight on to Lesson 11.2. First, however, check pupils' understanding by giving them some examples. Pupils often ask why they do mathematics with which they are not familiar. Linear programming is a good example of how mathematics can be used for unexpected and exciting ways that are extremely valuable in a modern society. **Unit 12 Compound units** All the material in this chapter will be new to pupils. However, you could combine Lesson 12.1 and Lesson 12.2 to make it one lesson. This challenge activity requires pupils to apply their learning from this chapter in a less familiar practical context.	What will pupils learn?	**Unit 10 Prisms and Cylinders** 10.1 Metric units for area and volume 10.2 Volume of a prism 10.3 Surface area of a prism 10.4 Volume of a cylinder 10.5 Surface area of a cylinder Review Questions and Problem solving Packaging cartons of fruit juice **Unit 11 Solving equations graphically** 11.1 Graphs from equations in the form ay +/- bx = c 11.2 Graphs from quadratic equations 11.3 Solving quadratic equations by drawing graphs 11.4 Solving simultaneous equations by graphs Review Questions and challenge – Linear Programming **Unit 12 Compound units** 12.1 Speed 12.2 More about proportion 12.3 Unit costs Review questions and Challenge - population density

Year Plan – Book 3.2 for Year 9 middle set

How will pupils be assessed?	Units 9 and 10 assessment from Collins Connect	What are the assessment criteria?	

Time period	**Term 4**	**Title**	**Maths Frameworking Pupil Book 3.2 Unit 13 Right-angled triangles**

Year Plan – Book 3.2 for Year 9 middle set

			Unit 14 Revision and GCSE Preparation
Number of lessons	Unit 13 Right-angled triangles (6 hours) Unit 14 Revision and GCSE Preparation (4 hours)	ICT links / tasks	
Literacy links / tasks		Numeracy links / tasks	
What should pupils know already?	**Unit 13 Right angled triangles** This chapter is new material and in many cases quite complex. Choose examples carefully to support or challenge pupils. This investigation is an interesting application of the learning in this unit. Pupils may be familiar with the idea from films but will probably be surprised at its use here. This is a good opportunity to demonstrate links to other subjects, in this case history. **Unit 14 Revision and GCSE Practice** The exercises in this chapter of the Pupil Book cover the following mathematical strands: • Algebra • Geometry and measures • Statistics • Number The material will provide excellent practice so that pupils become mathematically fluent. Encourage pupils to work through this whole chapter before their End of Year 9 tests.	What will pupils learn?	**Unit 13 Right angled triangles** 13.1 Introducing trigonometric ratios 13.2 How to find trigonometric ratios to find angles 13.3 Using trigonometric ratios to find angles 13.4 Using trigonometric ratios to find lengths Review Questions and Investigation Barnes Wallis and the bouncing bomb **Unit 14 Revision and GCSE Preparation** Revision and GCSE Preparation 14A Practice in the rules of algebra and solving equations 14B Practice in graphs 14C Practice in geometry and measures 14D Practice in statistics 14E Practice in number problems 14F Revision of equivalent fractions 14G Revision of adding and subtracting fractions 14H Revision of multiplying and dividing fractions 14I Revision of algebra GCSE Type questions
How will pupils be assessed?	Units 11, 12 and 13 assessment from Collins Connect	What are the assessment criteria?	

Time period	**Term 5**	**Title**	**Maths Frameworking Pupil Book 3.2**

Year Plan – Book 3.2 for Year 9 middle set

Number of lessons		ICT links / tasks	
Literacy links / tasks		Numeracy links / tasks	
What should pupils know already?		What will pupils learn?	
How will pupils be assessed?	End of year assessment Collins Connect	What are the assessment criteria?	