3-year scheme of work

The following scheme of work provides a suggestion for how Pupil Book 2.1 can be taught over the course of one year, as part of a 3-year Key Stage 3 course.

Please note that you can recombine the test questions provided on Collins Connect to create new tests if your frequency of assessment differs from that below, or if you wish to combine content from different chapters in your own half-term tests.

This scheme of work is provided in editable Word and Excel format on the CD-ROM accompanying this Teacher Pack.

Chapter	Lesson	No. of hours	Learning objective	Comments/ suggestions
Half-term / Term 1				
1 Working with numbers	1.1 Adding and subtracting with negative numbers	1	• To carry out additions and subtractions involving negative numbers	Pupils often learn rules without really understanding the reasoning behind each rule. Pupils will benefit from visual images such as a number line and/or an understanding of the patterns that lead to the rules, in this case how we use the four operations with positive and negative numbers. Then, when pupils are in stressful situations such as examinations, they can fall back on these images to provide backup if they are uncertain.
	1.2 Multiplying and dividing negative numbers	1	• To carry out multiplications and divisions involving negative numbers	One of the main misconceptions pupils have when multiplying two negative numbers is giving a negative answer. Reinforce the fact that when multiplying two negative numbers, the answer will always be positive. And, when multiplying two numbers, pupils often think that the sign of the answer is determined by the sign of the largest number. Remind pupils not to rush through their work, as they need to have a clear understanding of the rules.
	1.3 Factors and highest common factors (HCF)	1	• To understand and use highest common factors	Pupils sometimes confuse factors and multiples. (Say that multiples come from multiplying.)
	1.4 Multiples and lowest common multiple (LCM)	1	• To understand and use lowest common multiples	
	1.5 Squares, cubes and roots	1	• To understand and use squares and square roots • To understand and use cubes and cube roots	Reinforce the fact that the square root of a number can be both positive and negative. Another problem is that pupils often think that n^2 is $n \times 2$ or that n^3 is $n \times 3$. Explain clearly that this is not the case.
	1.6 Prime factors	1	• To understand what prime numbers are • To find the prime numbers of an integer	Remind pupils to include the multiplication signs when writing a number as a product of its prime factors. (These are often replaced incorrectly by addition signs or commas.)
	Challenge – The Eiffel Tower	1		This activity encourages pupils to think about a tourist attraction with different facilities and what is involved in running them. The topic could lead to class discussion about environmental issues such as electricity and water usage.
2 Geometry	2.1 Parallel and perpendicular lines	1	• To identify parallel lines • To identify perpendicular lines	Pupils often assume that when something seems to be correct, it is. However, pupils need to understand the importance of correct mathematical notation, for example, to identify parallel lines.

	2.2 Angles in triangles and quadrilaterals	1	• To know that the sum of the angles in a triangle is 180° • To know that the sum of the angles in a quadrilateral is 360°	Pupils often confuse rules because they don't really understand them. Give them the opportunity to apply the rules in a range of contexts and make the link between the angles in a triangle and the angles in a quadrilateral. This will serve as a basic introduction to proof. Provide lots of opportunity for discussion and encourage pupils to reflect on and extend the responses of other pupils.
	2.3 Translations	1	• To understand how to translate a point or a shape	A sound understanding of coordinates in all four quadrants will help pupils to understand translations. Physical demonstrations will also help pupils who may struggle with this.
	2.4 Rotations	1	• To understand how to rotate a shape	Pupils struggle to visualise rotations. Provide plenty of practice and if possible use active geometry packages such as GeoGebra.
	Challenge – Constructing triangles	1		This challenge gives pupils the opportunity to extend their learning to slightly more complex constructions. They need to be able to reproduce a set of instructions that build on what they have already done in the lesson.
Chapter 1–2 assessment on Collins Connect				
3 Probability	3.1 Probability scales	1	• To use a probability scale to represent a chance	Ask the class: 'What is the probability that you will ever travel in space?' Add that 100 years ago, the chance of this was nil because then it was impossible. However, the chance is increasing every decade. Scientists predict that many pupils who attend schools now will have a fair chance of travelling into space one day in their lifetime. Scientists calculate the probabilities by working out what is technically possible, and who might be able to afford it. We do not know if mass space travel will happen, but by studying probability, we can understand how likely it is to happen and how the scientists work it out.
	3.2 Collecting data for a frequency table	1	• To collect data and use it to find probabilities • To decide if an event is fair or biased	
	3.3 Mixed events	1	• To recognise mixed events where you can distinguish different probabilities	
	3.4 Using a sample space to calculate probabilities	1	• To use sample spaces to calculate probabilities	
	3.5 Experimental probability	1	• To calculate probabilities from experiments	Pupils often struggle to relate experimental data results to probabilities. Make sure pupils understand that experimental probabilities will be closer to the theoretical probability values if they increase the number of times they perform the experiment.
	Financial skills – Fun in the fairground	1		In this activity learners extend their understanding of probability to a real-life application that may be new to them. Pupils also make a real-life link between probability and financial skills.
Half-term				
Half-term / Term 2				
4 Percentages	4.1 Calculating percentages	1	• To write one quantity as a percentage of another	Percentage increase and decrease is probably one of the most common uses of mathematics in real life. Everyone meets it in some form or other even if only in terms of financial capability. Fractions, decimals and percentages are everywhere and it is important for pupils' confidence and accuracy to be able to move between these different representations. This chapter reinforces the links between fractions, decimals and percentages.
	4.2 Calculating the result of a percentage change	2	• To calculate the result of a percentage increase or decrease	
	4.3 Calculating a percentage change	2	• To work out a change of value as a percentage increase or decrease	
	Challenge – Changes in population	1		This activity is designed to give pupils the opportunity to demonstrate their understanding of percentage change in a real-life situation.

5 Sequences	5.1 The Fibonacci sequence	2	• To know and understand the Fibonacci sequence	Fibonacci numbers appear everywhere in nature, and are applicable to the growth of every living thing. The ability to generalise is crucial in a complex modern society. Being able to identify and generate number sequences is the first step towards progressing from the particular to the general in mathematics. Mathematics is all about the ability to see patterns, to hypothesise about these patterns and then seek to prove the hypothesis from first principles.
	5.2 Algebra and function machines	2	• To use algebra with function machines	
	5.3 The *n*th term of a sequence	2	• To use the *n*th term of a sequence	
	Investigation – Pond borders	1		Pupils apply their understanding of sequences to a real-life scenario. They will need to work methodically and be able to justify their solutions. Ask more able pupils to generalise their rules for an $m \times n$ pool.
Chapter 3–5 assessment on Collins Connect				
6 Area	6.1 Area of a rectangle	1	• To use a formula to work out the area of a rectangle	Remind pupils that perimeter, area and volume are used widely in many jobs and professions, from farming to astronomy. Encourage pupils to ask family and friends if they use these units of measure in their work. Pupils could also explore specific jobs on the internet. A good example is the building industry, which is totally dependent on workers being able to measure lengths and calculate areas.
	6.2 Areas of compound shapes	1	• To work out the area of a compound shape	
	6.3 Area of a triangle	1	• To use a formula to work out the area of a triangle	
	6.4 Area of a parallelogram	2	• To work out the area of a parallelogram	Pupils should understand that the height of a parallelogram is the vertical height, not the length of a side.
	Investigation – Pick's formula	2		In this investigation, pupils are required to apply their understanding of area to a more complex extended problem. Pupils need to work methodically and be able to explain their solutions. This is a good transferable skills objective to share with pupils when they work on this investigation. Ask pupils to share not only their solutions but also *how* they approached working on the problem.
Holidays				
Half-term / Term 3				
7 Graphs	7.1 Rules with coordinates	1	• To recognise patterns with coordinates	This chapter builds on previous work on mapping diagrams and graphs covered in Year 7, where pupils identified functions from inputs and outputs (including the inverse function) and related these to coordinate pairs, which are used to draw graphs.
	7.2 Graphs from rules	1	• To draw graphs of linear rules	
	7.3 Graphs from simple quadratic equations	2	• To recognise and draw the graph from a simple quadratic equation	
	7.4 Distance–time graphs	2	• To read and draw distance–time graphs	
	Problem solving – The M60	1		This problem solving activity encourages pupils to think about the M60, one of the UK's busiest orbital motorways. Read and then discuss the text in the Pupil Book. Ask pupils some questions relating to the text.
8 Simplifying numbers	8.1 Powers of 10	1	• To multiply and divide by 100 and 1000 • To round numbers to one decimal place	As with all use of powers, pupils tend to confuse 10^n with $10 \times n$. Provide pupils with plenty of opportunity to compare the two and to grasp why they are different. Comparing the two graphically could also help pupils to reinforce the difference.
	8.2 Large numbers and rounding	1	• To round large numbers	Pupils sometimes have problems with numbers that end in 9, especially if there are several 9s. Pupils may also

				struggle with numbers with trailing zeros. Provide plenty of opportunity to discuss examples. This applies to large numbers in the same way as it does to smaller numbers. Help pupils to see that in fact making the numbers larger does not make the process of rounding any different.
	8.3 Significant figures	1	• To round to one significant figure	Pupils tend to confuse rounding to decimal places and significant figures. Provide plenty of opportunity for pupils to compare the two. Pupils also struggle with the role of 0, and when this counts as a significant figure. Give pupils practice and answer any questions that arise.
	8.4 Estimating answers	2	• To use rounding to estimate rough answers to calculations	Pupils often assume that giving an exact answer is better than an estimate. Make sure that pupils grasp that this is often impractical or impossible in the real world. Give them a range of examples and make sure they appreciate that a good estimation provides an appropriate degree of accuracy while still being easier to calculate than the original calculation.
	8.5 Problem solving with decimals	1	• To solve problems with decimal numbers	Pupils are often confident when applying their understanding of place value to numbers greater than one, but may struggle with decimal fractions. Encourage pupils to see that the patterns are the same either side of the decimal point.
	Challenge – Space – to see where no one has seen before	1		This activity is designed to combine the skills covered across this chapter to explore an interesting real-life problem in a slightly more abstract context.
Chapter 6–8 assessment on Collins Connect				
9 Interpreting data	9.1 Information from charts	1	• To revise reading from charts and tables	In this chapter, pupils will look at some commonly used types of statistical diagrams – pie charts, line graphs and scatter graphs. Pupils will learn how to interpret them correctly and create them themselves.
	9.2 Reading pie charts	1	• To interpret a pie chart	
	9.3 Creating pie charts	1	• To use a scaling method to draw pie charts	
	9.4 Scatter graphs	2	• To read scatter graphs	
	Challenge – What should we eat?	2		This activity will challenge pupils to think about a familiar topic. Pupils are required to discuss what constitutes a healthy diet – the elements and proportions.
Half-term				
Half-term / Term 4				
10 Algebra	10.1 Algebraic notation	1	• To simplify algebraic expressions involving the four basic operations	Introduce algebra as a universal language with rules that are used all over the world. Mathematicians have been developing the rules of algebra for over 3000 years. The Babylonians used a form of algebra when they wrote on clay tablets, some of which have survived until today. Discuss a range of examples in which algebra is used. For example, the classic handshakes problem.
	10.2 Like terms	1	• To simplify algebraic expressions by combining like terms	
	10.3 Expanding brackets	1	• To remove brackets from an expression	
	10.4 Using algebra	2	• To use algebraic expressions in different contexts	
	10.5 Using powers	2	• To write algebraic expressions involving powers	
	Mathematical reasoning – Strawberries	2		This activity develops confidence and fluency with algebraic notation. Pupils often struggle to decode everyday language into mathematics. This activity gives them the opportunity to practise this in a range of contexts.

11 Congruence and scaling	11.1 Congruent shapes	1	• To recognise congruent shapes	Discuss the golden rectangle: its size (side lengths are in the ratio 1 : Φ; Φ is the Greek letter phi and is approximately equal to 1.618). Explain that this rectangle is special, because if you cut a square from one end of it, you will be left with a smaller shape, which is another golden rectangle, with sides that are in the same ratio as the rectangle you started with. The golden rectangle has been described as one of the most visually pleasing rectangular shapes, which many artists and architects have used in their work.
	11.2 Shape and ratio	1	• To use ratio to compare lengths and areas of 2D shapes	
	11.3 Scale diagrams	2	• To understand and use scale diagrams	
	Financial skills – Carpeting a bungalow	2		Pupils will need to be familiar with using basic scales and calculating areas and perimeters of rectangles and compound shapes involving rectangles. Pupils may also need a calculator for the financial elements.
Chapter 9–11 assessment on Collins Connect				
Holidays				
Half-term / Term 5				
12 Fractions and decimals	12.1 Adding and subtracting fractions	2	• To add and subtract fractions and mixed numbers	You could introduce this chapter by telling pupils that fractions have been written in different ways throughout history. Nowadays we use two ways of writing fractional numbers – either as one whole number over another whole number, or using a decimal point. In this chapter, pupils will see how these two methods compare.
	12.2 Multiplying fractions and integers	2	• To multiply a fraction or a mixed number by an integer	
	12.3 Dividing with integers and fractions	2	• To divide a unit fraction by an integer • To divide an integer by a unit fraction	
	12.4 Multiplication with powers of ten	1	• To multiply by a power of ten mentally	
	12.5 Division with powers of ten	1	• To mentally divide by a power of 10	
	Problem solving – Making estimates	1		This activity gives pupils the opportunity to practice their mental strategies in some real-life contexts. It also encourages pupils to make links to the use of estimation as well as the need to make assumptions when tackling real-life problems.
13 Proportion	13.1 Direct proportion	1	• To understand the meaning of direct proportion • To find missing values in problems involving proportion	This chapter introduces the concepts of direct and inverse proportion as a means of solving practical questions. Pupils will also learn about graphs that show direct proportion.
	13.2 Graphs and direct proportion	1	• To represent direct proportion graphically and algebraically	
	13.3 Inverse proportion	1	• To understand what is meant by inverse proportion • To solve problems using inverse proportion	
	13.4 The difference between direct and inverse proportion	1	• To recognise the difference between direct and inverse proportion in problems • To work out missing values	
	Challenge – Coach trip	1		For this challenge pupils apply their understanding of proportion to a typical real-life context including speed, time and fuel consumption. The questions increase in complexity and pupils will need to use a range of graphical and algebraic skills to tackle them. Pupils also need to be able to interpret some quite complex language.

Chapter 12–13 assessment on Collins Connect				
14 Circles	14.1 The circle and its parts	1	• To know the definition of a circle and the names of its parts	Tell pupils that the circle is probably the most important shape in the universe. It is also the most mysterious. We use a fascinating number that pupils may have heard of, called pi, written as π, which is used to calculate the circumference (perimeter) of a circle. But π cannot be written exactly as a number and its decimal places never end. Pupils could prepare for this chapter by doing their own research on π. Encourage pupils to present their findings to the class.
	14.2 Circumference of a circle	1	• To work out the relationship between the circumference and diameter of a circle	
	14.3 A formula to work out the approximate circumference of a circle	1	• To use a formula to work out the circumference of a circle	
	Activity – Constructions	2		You may want to start this activity by recapping how to construct triangles to remind pupils how they developed their ability to follow a set of instructions. Pupils working at this level often lack the motor skills required for construction activities. Give them time to practise, encouraging them not to rush.
Half-term				
Half-term / Term 6				
15 Equations and formulae	15.1 Equations	1	• To solve simple equations	This chapter starts by reviewing the simple equations that pupils have solved previously. Pupils are then shown how to solve equations with brackets and fractions. Finally, pupils will learn how to substitute into a formula.
	15.2 Equations with brackets	1	• To solve equations which include brackets	
	15.3 More complex equations	2	• To solve equations involving two operations	
	15.4 Substituting into formulae	1	• To substitute values into a variety of formulae	
	Reasoning – Old trees	1		In this activity, pupils use mathematical reasoning to make links between formulae and the real world.
16 Comparing data	16.1 Frequency tables	1	• To create a grouped frequency table from raw data	Encourage pupils to think about how statistics are used. Pupils need to consider how to present information. Pupils also need to think about how we use statistics to model populations where it is difficult, or in many cases impossible, to gather all the population information.
	16.2 The mean	1	• To understand and calculate the mean average of data	
	16.3 Drawing frequency diagrams	1	• To be able to draw a diagram from a frequency table	
	16.4 Comparing data	1	• To use the mean and range to compare data from two sources	
	16.5 Which average to use?	1	• To understand when each different type of average is most useful	
	Problem solving – Questionnaire	1		This activity is designed to combine all the lessons in this chapter by taking pupils sequentially through the steps of tabulating and displaying data for a very familiar real-life problem. All the data is given, but pupils will need to read and think carefully about how they display the data so that they can make valid comparisons.
Chapter 14–16 assessment on Collins Connect				
End of year assessment on Collins Connect				

2-year scheme of work

The following scheme of work provides a suggestion for teaching Pupil Book 2.1 as part of a 2-year Key Stage 3 course.

Please note that you can recombine the test questions provided on Collins Connect to create new tests if your frequency of assessment differs from that below, or if you wish to combine content from different chapters in your own half-term tests.

This scheme of work is provided in editable Word and Excel format on the CD-ROM accompanying this Teacher Pack.

Chapter	Lesson	No. of hours	Learning objective	Comments/ suggestions
Half-term / Term 1				
1 Working with numbers	1.1 Adding and subtracting with negative numbers	1	• To carry out additions and subtractions involving negative numbers	Much of the material in this chapter will be new to Year 8 pupils. However, pupils could leave out Exercise 1A of the Pupil Book, which was covered in Year 7. If pupils are quick to grasp the concepts in this chapter they can move swiftly through the exercises, leaving out some of the questions.
	1.2 Multiplying and dividing negative numbers		• To carry out multiplications and divisions involving negative numbers	
	1.3 Factors and highest common factors (HCF)	1	• To understand and use highest common factors	
	1.4 Multiples and lowest common multiple (LCM)		• To understand and use lowest common multiples	
	1.5 Squares, cubes and roots	1	• To understand and use squares and square roots • To understand and use cubes and cube roots	
	1.6 Prime factors	1	• To understand what prime numbers are • To find the prime numbers of an integer	
	Challenge – The Eiffel Tower	1		This activity encourages pupils to think about a tourist attraction with different facilities and what is involved in running them. The topic could lead to class discussion about environmental issues such as electricity and water usage.
2 Geometry	2.1 Parallel and perpendicular lines	1	• To identify parallel lines • To identify perpendicular lines	Pupils working at this level are likely to find the work in this lesson more challenging. Encourage plenty of discussion. However, if pupils respond well to the introductions, you may be able to combine Lesson 2.3 and Lesson 2.4 by using some of the more challenging questions.
	2.2 Angles in triangles and quadrilaterals	1	• To know that the sum of the angles in a triangle is 180° • To know that the sum of the angles in a quadrilateral is 360°	
	2.3 Translations	1	• To understand how to translate a point or a shape	
	2.4 Rotations	1	• To understand how to rotate a shape	
	Challenge – Constructing triangles	1		This challenge gives pupils the opportunity to extend their learning to slightly more complex constructions. They need to be able to reproduce a set of instructions that build on what they have already done in the lesson.
Chapters 1–2 assessment on Collins Connect				
3 Probability	3.1 Probability scales	1	• To use a probability scale to represent a chance	Much of the material in this chapter will be new. However, if pupils are familiar with Lesson 3.1 from Year 7, they can move on to the activity at the end of Exercise 3A in the Pupil Book.
	3.2 Collecting data for a frequency table	1	• To collect data and use it to find probabilities • To decide if an event is fair or biased	

	3.3 Mixed events	1	• To recognise mixed events where you can distinguish different probabilities	
	3.4 Using a sample space to calculate probabilities	1	• To use sample spaces to calculate probabilities	
	3.5 Experimental probability		• To calculate probabilities from experiments	
	Financial skills – Fun in the fairground	1		In this activity learners extend their understanding of probability to a common real-life application that they may not have previously considered. This activity also makes a real-life link between probability and financial skills.
Half-term				
Half-term / Term 2				
4 Percentages	4.1 Calculating percentages	1	• To write one quantity as a percentage of another	Although pupils have met percentages before there are some important and quite challenging concepts in this chapter. The idea of percentages as a multiplier and the use of multiplicative reasoning are very important to pupils' confidence and fluency with percentages. Be careful about rushing the conceptual understanding for pupils working at this level.
	4.2 Calculating the result of a percentage change	1	• To calculate the result of a percentage increase or decrease	
	4.3 Calculating a percentage change	1	• To work out a change of value as a percentage increase or decrease	
	Challenge – Changes in population	1		This activity is designed to give pupils the opportunity to demonstrate their understanding of percentage change in a real-life situation.
5 Sequences	5.1 The Fibonacci sequence	1	• To know and understand the Fibonacci sequence	Pupils can leave out Exercise 5A in the Pupil Book if they are familiar with the Fibonacci sequence. Pupils can also jump to the investigation on the *n*th term at the end of Exercise 5B if they have met this in Year 7.
	5.2 Algebra and function machines	1	• To use algebra with function machines	
	5.3 The *n*th term of a sequence	1	• To use the *n*th term of a sequence	
	Investigation – Pond borders	1		Pupils apply their understanding of sequences to a real-life scenario. They will need to work methodically and be able to justify their solutions. Ask more able pupils to generalise their rules for an $m \times n$ pool.
Chapters 3–5 assessment on Collins Connect				
6 Area	6.1 Area of a rectangle 6.2 Area of compound shapes	1	• To use a formula to work out the area of a rectangle • To work out the area of a compound shape	Pupils should be familiar with many of the concepts in this chapter. Check their understanding with some examples. Then move on to the MR and PS questions, and the activities at the end of each exercise in this chapter. You could also combine Lesson 6.1 and Lesson 6.2.
	6.3 Area of a triangle	1	• To use a formula to work out the area of a triangle	
	6.4 Area of a parallelogram	1	• To work out the area of a parallelogram	
	Investigation – Pick's formula	2		In this investigation, pupils are required to apply their understanding of area to a more complex extended problem. Pupils need to work methodically and be able to explain their solutions. This is a good transferable skills objective to share with pupils when they work on this investigation. Ask pupils to share not only their solutions but also *how* they approached working on the problem.
7 Graphs	7.1 Rules with coordinates	1	• To recognise patterns with coordinates	It is important to take time over the examples in this chapter. Sometimes, however, it is more worthwhile to work through one or two examples in depth
	7.2 Graphs from rules	1	• To draw graphs of linear rules	

	7.3 Graphs from simple quadratic equations	1	• To recognise and draw the graph from a simple quadratic equation	as a class, followed by picking out just one or two key examples for pupils.
	7.4 Distance–time graphs	1	• To read and draw distance–time graphs	
	Problem solving – The M60	1		This problem solving activity encourages pupils to think about the M60, one of the UK's busiest orbital motorways. Read and then discuss the text in the Pupil Book. Ask pupils some questions relating to the text.
Holidays				
Half-term / Term 3				
8 Simplifying numbers	8.1 Powers of 10	1	• To multiply and divide by 100 and 1000 • To round numbers to one decimal place	There are new ideas in all these chapters, but they do build on pupils' existing knowledge of rounding and the number system. Check pupils' understanding by working through some examples as a class. Then ask pupils to focus on the PS and MR questions in the exercises, plus the challenges, activity, and investigation at the end of the exercises in this chapter.
	8.2 Large numbers and rounding	1	• To round large numbers	
	8.3 Significant figures	1	• To round to one significant figure	
	8.4 Estimating answers	1	• To use rounding to estimate rough answers to calculations	
	8.5 Problem solving with decimals	1	• To solve problems with decimal numbers	
	Challenge – Space – to see where no one has seen before	1		This activity is designed to combine the skills covered across this chapter to explore an interesting real-life problem in a slightly more abstract context.
Chapters 6–8 assessment on Collins Connect				
9 Interpreting Data	9.1 Information from charts 9.2 Reading pie charts	1	• To work out the sectors in pie charts by their angles at the centre • To use a scaling method to draw pie charts	Pupils could leave out Lesson 9.1 if they are familiar with the concepts from Year 7. You could combine Lesson 9.2 and Lesson 9.3. Make sure that pupils have a good grasp of correlation before moving on.
	9.3 Creating pie charts	1	• To read scatter graphs • To understand correlation	
	9.4 Scatter graphs	1	• To create scatter graphs	
	Challenge – What should we eat?	2		This activity will challenge pupils to think about a familiar topic. Pupils are required to discuss what constitutes a healthy diet – the elements and proportions.
10 Algebra	10.1 Algebraic notation 10.2 Like terms	1	• To simplify algebraic expressions involving the four basic operations • To simplify algebraic expressions by combining like terms	Pupils should have met the concepts in Lesson 10.1 and Lesson 10.2 before. Work through some examples to check pupils' understanding and then move on to Lesson 10.3.
	10.3 Expanding brackets	1	• To remove brackets from an expression	
	10.4 Using algebra	1	• To use algebraic expressions in different contexts	
	10.5 Using powers	1	• To write algebraic expressions involving powers	
	Mathematical reasoning – Strawberries	2		This activity develops confidence and fluency with algebraic notation. Pupils often struggle to decode everyday language into mathematics. This activity gives them the opportunity to practise this in a range of contexts.
11 Congruence and scaling	11.1 Congruent shapes	1	• To recognise congruent shapes	Pupils will have met some of the basic concepts in this chapter. If the class can demonstrate that they are confident and fluent with these basic concepts, pupils can move on to the more challenging questions at the end of each exercise.
	11.2 Shape and ratio	1	• To use ratio to compare lengths and areas of 2D shapes	
	11.3 Scale diagrams	1	• To understand and use scale diagrams	

	Financial skills – Carpeting a bungalow	2		Pupils will need to be familiar with using basic scales and calculating areas and perimeters of rectangles and compound shapes involving rectangles. Pupils may also need a calculator for the financial elements.
Chapter 9–11 assessment on Collins Connect				
Half-term				
Half-term / Term 4				
12 Fractions and decimals	12.1 Adding and subtracting fractions	1	• To add and subtract fractions and mixed numbers	Much of the material in this chapter should be familiar to pupils. However, before moving on make sure that pupils are confident and fluent, as the concepts in this chapter are often key barriers for pupils working at this level. If you have checked and are happy with pupils' confidence and fluency, then you could combine Lesson 12.2 and Lesson 12.3, and Lesson 12.4 and Lesson 12.5.
	12.2 Multiplying fractions and integers	1	• To multiply a fraction or a mixed number by an integer	
	12.3 Dividing with integers and fractions	1	• To divide a unit fraction by an integer • To divide an integer by a unit fraction	
	12.4 Multiplication with powers of ten	1	• To multiply by a power of ten mentally	
	12.5 Division with powers of ten	1	• To mentally divide by a power of 10	
	Problem solving – Making estimates	1		This activity gives pupils the opportunity to practice their mental strategies in some real-life contexts. It also encourages pupils to make links to the use of estimation as well as the need to make assumptions when tackling real-life problems.
13 Proportion	13.1 Direct proportion	1	• To understand the meaning of direct proportion • To find missing values in problems involving proportion	Much of the material in this chapter will be unfamiliar to pupils. Make sure that all pupils understand each concept fully before moving on to the MR and PS questions in the exercises, and the activities at the end of each exercise.
	13.2 Graphs and direct proportion	1	• To represent direct proportion graphically and algebraically	
	13.3 Inverse proportion	1	• To understand what is meant by inverse proportion • To solve problems using inverse proportion	
	13.4 The difference between direct and inverse proportion	1	• To recognise the difference between direct and inverse proportion in problems • To work out missing values	
	Challenge – Coach trip	1		For this challenge pupils apply their understanding of proportion to a typical real-life context including speed, time and fuel consumption. The questions increase in complexity and pupils can use a range of graphical and algebraic skills to tackle them. They also need to be able to interpret some quite complex language.
Chapter 12–13 assessment on Collins Connect				
14 Circles	14.1 The circle and its parts 14.2 Circumference of a circle	1	• To know the definition of a circle and the names of its parts • To work out the relationship between the circumference and diameter of a circle	Pupils may be familiar with the content of Lesson 14.1. Check pupils' understanding by working through some examples with the class. If all pupils are confident and fluent, you could move straight on to Lesson 14.2.
	14.3 A formula to work out the approximate circumference of a circle	1	• To use a formula to work out the circumference of a circle	
	Activity – Constructions	2		You may want to start this activity by recapping how to construct triangles to remind pupils how they developed their ability to follow a set of instructions. Pupils working at this

				level often lack the motor skills required for construction activities. Give them time to practise, encouraging them not to rush.
15 Equations and formulae	15.1 Equations 15.2 Equations with the variable on both sides	1	• To solve simple equations involving brackets • To solve equations which include brackets	Much of this chapter will be new material. However, pupils who are familiar with multiplying out brackets and solving simple equations will be able to complete Exercise 15A in the Pupil Book quickly before moving on to Exercise 15B. Or, you could suggest that these pupils leave out Exercise 15A altogether and start with Exercise 15B.
	15.3 More complex equations	1	• To solve equations involving two operations	
	15.4 Substituting into formulae	1	• To substitute values into a variety of formulae	
	Reasoning – Old trees	1		In this activity, pupils use mathematical reasoning to make links between formulae and the real world.
16 Comparing data	16.1 Frequency tables 16.2 The mean	1	• To create a grouped frequency table from raw data • To understand and calculate the mean average of data	Use the examples in Lesson 16.1 and 16.2 in the Pupil Book to check pupils' understanding. If pupils are fluent and confident with the concepts, move straight to Lesson 16.3, where pupils will compare data and make decisions about the most appropriate statistical measures they should use.
	16.3 Drawing frequency diagrams 16.4 Comparing data 16.5 Which average to use?	2	• To be able to draw a diagram from a frequency table • To use the mean and range to compare data from two sources • To understand when each different type of average is most useful	
	Problem solving – Questionnaire	1		This activity is designed to combine all the lessons in this chapter by taking pupils sequentially through the steps of tabulating and displaying data for a very familiar real-life problem. All the data is given but pupils will need to read and think carefully about how they display the data so that they can make valid comparisons.
Chapter 14–16 assessment on Collins Connect				
End of year assessment on Collins Connect				
Holidays				
Half-term / Term 5				
Work continues with Pupil Book 3.1				
Half-term				
Half-term / Term 6				
Work continues with Pupil Book 3.1				

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