

# Year 7

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7		Week 8	Week 9	Week 10
Sequences		Understand and Use Notation		Equality and Equivalence			October Break	Place Value		Number Sense
Week 11	Week 12	Week 13	Week 14			Week 15	Week 16	Week 17	Week 18	Week 19
Number Sense	FDP Equivalence			Christmas Break	Christmas Break	Addition and subtraction		Multiplication and Division		Fraction and Percentage of amount
Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26	Week 27			Week 28
Fraction and Percentage of amount	February Break	Operations with directed numbers		Add and Subtract Fractions		Multiplying and Dividing Fractions		Easter Break	Easter Break	Construction and Measure
Week 29	Week 30	Week 31	Week 32	Week 33		Week 34	Week 35	Week 36	Week 37	Week 38
Construction and Measure	Geometric Reasoning		Sets and Probability		May Break	Prime Numbers and Proof		Working in the Cartesian Plane		

# Unit 7.1: Sequences

Time allocation	Skills and Knowledge	Where Learning Sits	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 Lessons</b></p>	<ol style="list-style-type: none"> <li>1. Describe and continue a sequence given diagrammatically.</li> <li>2. Predict and check the next term(s) of a sequence.</li> <li>3. Represent sequences in tabular and graphical forms</li> <li>4. Recognise the difference between linear and non-linear sequences.</li> <li>5. Continue numerical linear sequences.</li> <li>6. Continue numerical non-linear sequences.</li> <li>7. Explain the term-to-term rule of a numerical sequence in words.</li> <li>8. Find missing numbers within sequences (H).</li> </ol>	<p><b>Next</b></p> <p>7.5 Number Sense 7.17 Working in the Cartesian Plane 8.17 Straight line graphs</p>	<ul style="list-style-type: none"> <li>• Addition</li> <li>• <b>Ascending</b></li> <li>• Axes</li> <li>• Constant</li> <li>• <b>Descending</b></li> <li>• <b>Difference</b></li> <li>• Division</li> <li>• Fibonacci</li> <li>• Geometric</li> <li>• Graph</li> <li>• <b>Linear</b></li> <li>• Multiplication</li> <li>• Non-linear</li> <li>• <b>Position</b></li> <li>• Sequence</li> <li>• Subtraction</li> <li>• <b>Term</b></li> </ul>	<p><b>Excelling</b></p> <p>1.3 Find and justify the nth term of a sequence. 1.4 Prove that a number is in a sequence.</p> <p><b>Exceeding</b></p> <p>2.1 Recognise and describe a non-linear sequence. 2.3 Explain if a number is in a sequence or not. 2.2 Use BIDMAS to find a given term in a 2 step sequence.</p> <p><b>Expected</b></p> <p>3.1 Recognise all the common sequences. 3.2 Use BIDMAS to find a given term in a 1 step sequence.</p> <p><b>Emerging</b></p> <p>4.1 Recognise some common sequences. 4.2 Continue linear sequences. 4.2 Continue pictorial sequences.</p>
		<p><b>New</b></p> <p>Writing sequences using algebraic notation. Substituting into expressions. Using different functions of a scientific calculator.</p>		
		<p><b>Prior</b></p> <p>Sequences were covered, both numerical and pictorial forms, in KS3.</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Strategic games such as chess</li> <li>• Investment and Savings – both simple and compound interest</li> <li>• Acceleration of a test vehicle</li> <li>• Nature – petal/leaf placement on a flower</li> <li>• Infection rates of disease</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Writing calculations on a single continuous line e.g. <math>3 \times 5 = 15 \times 2 = 30</math>.</li> <li>• Assuming that sequences rules can be established with only 3 terms.</li> </ul>	

# Unit 7.2: Understand and use notation

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<b>5 Lessons</b>	<ol style="list-style-type: none"> <li>1. Given numerical input, find the output of a single function machine.</li> <li>2. Use inverse operations to find the input given the output.</li> <li>3. Use diagrams and letters to generalise number operations.</li> <li>4. Use diagrams and letters with single function machines.</li> <li>5. Find the function machine given a simple expression.</li> <li>6. Substitute values into single operation expressions.</li> <li>7. Find numerical inputs and outputs for a series of two function machines.</li> <li>8. Use diagrams and letters with a series of two function machines.</li> <li>9. Find the function machines given a two-step expression.</li> <li>10. Substitute values into two-step expressions.</li> <li>11. Generate sequences given an algebraic rule.</li> <li>12. Represent one and two-step functions graphically.</li> </ol>	<p><b>Next</b>            7.3 Equality and equivalence            7.12 Multiply and divide fractions            7.17 Working in the Cartesian plane            8.5 Brackets, Equations and inequalities            8.7 Sequences            8.8 Indices</p> <hr/> <p><b>New</b>            Using algebraic notation and understanding the purpose of doing so            Understanding algebraic expressions            Moving away from function machines into algebraic notation            Substituting values into algebraic expressions</p> <hr/> <p><b>Prior</b>            Function machines were introduced in KS2            Solving one-step equations – previously written numerically only (non algebraic)</p>	<ul style="list-style-type: none"> <li>• <b>Coefficients</b></li> <li>• Equations</li> <li>• Expressions</li> <li>• Identities</li> <li>• <b>Indices/Index</b></li> <li>• Input/output</li> <li>• <b>Inverse</b></li> <li>• <b>Linear</b></li> <li>• <b>Substitute</b></li> <li>• <b>Variables</b></li> <li>• Equals</li> <li>• Equal to / Is equal to</li> <li>• Like</li> <li>• Unlike</li> </ul>	<p><b>Excelling</b>            1.2 Generate a sequence given an algebraic rule.            1.2 Represent 1 and 2 step functions graphically.</p> <p><b>Exceeding</b>            2.2 Use a function machine to create a 2 step equation.            2.2 Identify the functions, given a 2 step expression.</p> <p><b>Expected</b>            3.2 Use function machines to create 1 step expressions.            3.2 Identify the functions, given a 1 step expression.            3.2 Substitute into 1 step expressions.</p> <p><b>Emerging</b>            4.1 Recall operations and their inverses.            4.2 Find numerical inputs &amp; outputs of function machines.</p>
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Use of algebra in modelling situations- cooking, engineering, design, real life examples</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Misconceptions with simplifying expressions e.g. use of the</li> <li>• Use of <math>a^3</math> instead of <math>3a</math></li> <li>• Use of <math>a^2</math> instead of <math>a^2</math></li> <li>• <math>2(x + 3) = 2x + 6</math></li> <li>• Collecting <math>2x</math> and <math>x^2</math> together as like terms<sup>2</sup></li> <li>• Working with negative values and variables</li> </ul>	

# Unit 7.3: Equality and Equivalence

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>5 Lessons</b></p>	<ol style="list-style-type: none"> <li>1. Understand the meaning of equality</li> <li>2. Understand and use fact families, numerically and algebraically.</li> <li>3. Solve one-step linear equations involving +/- using inverse operations.</li> <li>4. Solve one-step linear equations involving x/÷ using inverse operations.</li> <li>5. Understand the meaning of like and unlike terms.</li> <li>6. Understand the meaning of equivalence</li> <li>7. Simplify algebraic expressions by collecting like terms, using the <math>\equiv</math> symbol.</li> </ol>	<p><b>Next</b> 7.17 Working in the Cartesian Plane 8.5 Brackets, Equation and Equalities</p>	<ul style="list-style-type: none"> <li>• Coefficients</li> <li>• <b>Equations</b></li> <li>• <b>Expressions</b></li> <li>• <b>Identities</b></li> <li>• Indices/Index</li> <li>• Input/output</li> <li>• Inverse</li> <li>• Linear</li> <li>• <b>Substitute</b></li> <li>• <b>Variables</b></li> <li>• Equals</li> <li>• Equal to / Is equal to</li> <li>• <b>Like</b></li> <li>• <b>Unlike</b></li> </ul>	<p><b>Excelling</b> 1.3 Use checking to justify a solution is correct.</p> <p><b>Exceeding</b> 2. 2 Solve 1 &amp; 2 step equations with decimal solutions.</p> <p><b>Expected</b> 3.2 Solve 1 &amp; 2 step equations with integer solutions.</p> <p><b>Emerging</b> 4.1 Understand and use fact families.</p>
		<p><b>New</b> Identifying and collecting like terms Solving one-step equations Equality and inequality notation</p>		
		<p><b>Prior</b> Fact families Progressing existing concepts from function machines</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Use of algebra in modelling situations- cooking, engineering, design, real life examples</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Misconceptions with simplifying expressions e.g. use of the</li> <li>• Use of a3 instead of 3a</li> <li>• Use of a2 instead of a<sup>2</sup></li> <li>• 2(x + 3) = 2x + 6</li> <li>• Collecting 2x and x<sup>2</sup>together as like terms<sup>2</sup></li> <li>• Working with negative values and variables</li> </ul>	

# Unit 7.4: Place Value

Time allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 Lessons</b></p>	<ol style="list-style-type: none"> <li>1. Recognise the place value of any number in an integer up to one billion.</li> <li>2. Understand and write integers up to one billion in words and figures.</li> <li>3. Work out intervals on a number line.</li> <li>4. Position integers on a number line.</li> <li>5. Round integers to the nearest power of ten.</li> <li>6. Compare two numbers using +, ≠, &lt;, &gt;, ≤.</li> <li>7. Order a list of integers.</li> <li>8. Find the range of a set of numbers.</li> <li>9. Find the median of a set of numbers.</li> <li>10. Understand place value for decimals.</li> <li>11. Position decimals on a number line.</li> <li>12. Compare and order any number up to one billion.</li> <li>13. Round a number to 1 significant figure.</li> <li>14. Write 10, 100, 1000 etc as a power of 10 (H).</li> <li>15. Write positive integers in the form <math>A \times 10^n</math> (H).</li> <li>16. Investigate negative powers of ten (H).</li> <li>17. Write decimals in the form <math>A \times 10^n</math> (H).</li> </ol>	<p><b>Next</b></p> <p>7.5 Number Sense 7.6 Addition and Subtraction 8.5 Brackets, Equations and Equivalence 8.10 Standard Form</p> <hr/> <p><b>New</b></p> <p>Writing and converting in standard form Finding the median and range of a set of data Rounding to a significant figure</p> <hr/> <p><b>Prior</b></p> <p>Ordering integers and decimals Rounding integers to the nearest power of ten</p>	<ul style="list-style-type: none"> <li>• Ascending</li> <li>• Descending</li> <li>• Digit</li> <li>• Equal, not equal, greater, less than</li> <li>• Integer</li> <li>• Interval</li> <li>• Place Value</li> <li>• Rounding</li> <li>• Significant Figure</li> </ul>	<p><b>Excelling</b></p> <p>1.2 I can order numbers in standard form. 1.3 I can use place value to explain conversions to standard form. 1.3 I can explain the differences and similarities between rounding to decimal places and significant figures.</p> <p><b>Exceeding</b></p> <p>2.2 I can round to a given number of significant figures. 2.2 I can order algebraic expressions.</p> <p><b>Expected</b></p> <p>3.2 I can round to a given number of decimal places. 3.2 I know &amp; can use the rounding rules. 3.2 I know and can use decimal place values.</p> <p><b>Emerging</b></p> <p>4.2 I can round to powers of 10 4.2 I can order positive and negative integers. 4.1 I know integer place values.</p>
	<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Use of standard form in scientific applications.</li> <li>• The implication of estimation and errors that can be caused.</li> <li>• Links to money- large figures of money and the comparison. Use of decimal points when it comes to pound and pence</li> </ul>	<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• 0.241 is bigger than 0.3 due to having more digits.</li> <li>• Spacing on axis and number lines</li> <li>• Inequalities and comparison of negative numbers</li> </ul>		

# Unit: 7.5: Number Sense

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 Lessons</b></p>	1. Know and use mental addition and subtraction strategies for integers. 2. Know and use mental multiplication and division strategies for integers. 3. Know and use mental arithmetic strategies for decimals. 4. Know and use mental arithmetic strategies for fractions. 5. Use factors to simplify calculations.	<b>Next</b> 7.6 FDP Equivalence 7.7 Addition and Subtraction 7.8 Multiplication and Division 8.6 Prime numbers and proof	<ul style="list-style-type: none"> <li>• Algebra</li> <li>• Associative</li> <li>• Bar Modelling</li> <li>• <b>BIDMAS</b></li> <li>• Calculate</li> <li>• Decimal</li> <li>• Decimal Place</li> <li>• <b>Denominator</b></li> <li>• Equation</li> <li>• Equivalent</li> <li>• Estimate</li> <li>• Factors</li> <li>• Fraction</li> <li>• Multiples</li> <li>• Number lines</li> <li>• <b>Numerator</b></li> <li>• Partition</li> <li>• Place Value</li> <li>• Product</li> <li>• <b>Rounding</b></li> <li>• <b>Significant Figures</b></li> <li>• Simplify</li> <li>• Sum</li> <li>• Quotient</li> </ul>	<p><b>Excelling</b></p> 1.2 I can use algebraic facts to derive other facts. 1.3 I can justify my chosen strategy to solve problems. <p><b>Exceeding</b></p> 2.2 I can use estimation for checking. 2.2 I can use factors to simplify answers. 2.2 I can use number facts to derive other facts. <p><b>Expected</b></p> 3.2 I can use mental methods to perform operations with decimals and fractions. <p><b>Emerging</b></p> 4.2 I can use mental methods to perform operations with integers. 4.2 I can use BIDMAS correctly.
	6. Use estimation as a method for checking mental calculations. 7. Use known number facts to derive other facts. 8. Use known algebraic facts to derive other facts. 9. Know when to use a mental strategy, formal written method or calculator.	<b>New</b> Using mental math strategies for decimals Using factors to simplify calculations Applying fact families for algebraic expressions		
		<b>Prior</b> Rounding to one significant figure (previous unit) Progressing mental math strategies Using number facts such as identifying even numbers		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Architecture.</li> <li>• Building and design.</li> <li>• Model making.</li> <li>• Linking problems solving to bar modelling</li> <li>• Linking algebra to bar modelling.</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Using formal methods for operations for expressions which do not require it</li> <li>• Using column method – prioritise grid or Chinese method for multiplication</li> <li>• Instead of long division, dividing by the factors of the divisors</li> </ul>	

# Unit 7.6

# FDP Equivalence

Time allocation	Skills and Knowledge	Where Learning Sits	Keywords - Be explicitly clear on terminology and language	What I will be learning:	
<p style="text-align: center;"><b>6 Lessons</b></p>	1. Represent tenths and hundredths as diagrams. 2. Represent tenths and hundredths on number lines. 3. Interchange between fractional and decimal number lines. 4. Convert between fractions and decimals – tenths and hundredths. 5. Convert between fractions and decimals – fifths and quarters.	<b>Next</b> 7.9 Fraction and Percentage of Amount 7.15 Sets and Probability 8.4 Tables and Probability 8.9 Fractions and Percentages	<ul style="list-style-type: none"> <li>• Decimal</li> <li>• <b>Denominator</b></li> <li>• Fraction</li> <li>• <b>Improper</b></li> <li>• <b>Mixed Number</b></li> <li>• <b>Numerator</b></li> <li>• Percentage</li> <li>• Place value</li> <li>• <b>Quotient</b></li> <li>• <b>Recurring</b></li> <li>• Tenths, hundredths etc.</li> </ul>	<p><b>Excelling</b></p> 1.3 I can convert between any FDP with any denominator & justify equivalence. 1.4 I can solve problems with a combination of FDP. <p><b>Exceeding</b></p> 2.3 I can perform & explain operations with a combination of FDP. 2.3 I can explain the equivalence of fractions when putting them in order. <p><b>Expected</b></p> 3.2 I can convert FDP when some denominators need converting. 3.2 I can compare/order a combination of FDP 3.2 I can perform some equivalences. <p><b>Emerging</b></p> 4.1 I can explain unit fractions pictorially. 4.2 I can convert between FDP using place value columns. 4.1 I can recall simple FDP equivalences.	
	6. Convert between fractions and decimals – eighths and thousandths. (H). 7. Understand the meaning of percentage using a hundred square. 8. Convert fluently between simple fractions, decimals and percentages.	<b>New</b> Convert all variations of fractions, decimals and percentage Operations with FDP Interpreting pie charts Converting FDP with values greater than one			
	9. Use and interpret pie charts. 10. Represent any fraction as a diagram. 11. Represent fractions on number lines. 12. Identify and use simple equivalent fractions. 13. Understand fractions as division 14. Convert fluently between fractions, decimals and percentages. 15. Explore fractions above one, decimals and percentages (H).	<b>Prior</b> Representing numbers as diagrams and on a number line Understanding percentage as a hundred square Covert between basic fractions, decimals and percentages			
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Use of money and money facts to show change in percentages and fractions</li> <li>• Cooking and baking- fractions of amounts and scaling/proportion</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Cannot have a fraction or percentage greater than 1</li> <li>• Thinking 2/5 and 5/2 are the same</li> </ul>		

# Unit 7.7

# Addition and Subtraction

Time allocation	Skills and Knowledge	Where Learning Sits	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Properties of addition and subtraction.</li> <li>2. Mental strategies for addition and subtraction.</li> <li>3. Use formal methods for addition of integers.</li> <li>4. Use formal methods for addition of decimals.</li> <li>5. Use formal methods for subtraction of integers.</li> <li>6. Use formal methods for subtraction of decimals.</li> <li>7. Choose the most appropriate method: mental strategies, formal written or calculator.</li> <li>8. Solve problems in the context of perimeter.</li> <li>9. Solve financial maths problems.</li> <li>10. Solve problems involving tables and timetables.</li> <li>11. Solve problems with frequency trees.</li> <li>12. Solve problems with bar charts and line charts.</li> <li>13. Add and subtract numbers given in standard form (H).</li> </ol>	<p><b>Next</b></p> <p>7.10 Operations with directed numbers 7.14 Geometric reasoning 8.4 Tables and Probability 8.13 Angles in parallel lines</p>	<ul style="list-style-type: none"> <li>• Addition</li> <li>• Subtraction</li> <li>• Take away</li> <li>• Add on</li> <li>• Integer</li> <li>• Decimal</li> <li>• Money</li> <li>• Finance</li> <li>• Sum</li> <li>• Place Value</li> </ul>	<p><b>Excelling</b></p> <p>1.2 I can interpret algebraic frequency trees. 1.2 I can find the perimeter of shapes with algebraic expressions. 1.2 I can add &amp; subtract in standard form, without converting.</p> <p><b>Exceeding</b></p> <p>2.2 I can interpret other charts. 2.2 I can find the perimeter of shapes with decimals &amp; fractions. 2.3 I can explain if an answer is reasonable or not.</p> <p><b>Expected</b></p> <p>3.2 I can find the perimeter of shapes with integers. 3.4 I can solve financial problems involving addition and subtraction. 3.2 I can interpret frequency trees.</p> <p><b>Emerging</b></p> <p>4.2 I can use mental &amp; formal methods for addition and subtraction. 4.1 I can recognise and use times in 24 hour clock.</p>
		<p><b>New</b></p> <p>Discussing and exploring numerous mental math strategies Financial maths – the terminology which needs to be used Add and subtract numbers in standard form</p>		
		<p><b>Prior</b></p> <p>Formal methods of addition and subtraction Basic financial math questions</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Use of money and money facts to show change in percentages and fractions</li> <li>• Cooking and baking- fractions of amounts and scaling/proportion</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Cannot have a fraction or percentage greater than 1</li> <li>• Thinking 2/5 and 5/2 are the same</li> </ul>	



# Unit 7.8

# Multiplication and Division

Time allocation	Skills and Knowledge	Where Learning Sits	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Properties of multiplication and division.</li> <li>2. Understand and use factors.</li> <li>3. Understand and use multiples.</li> <li>4. Multiply and divide integers and decimals by powers of 10.</li> <li>5. Multiply by 0.1 and 0.01 (H).</li> <li>6. Convert metric units.</li> <li>7. Use formal methods to multiply integers.</li> <li>8. Use formal methods to multiply decimals.</li> <li>9. Use formal methods to divide integers.</li> <li>10. Use formal methods to divide decimals.</li> <li>11. Understand and use order of operations.</li> <li>12. Solve problems using the area of rectangles and parallelograms.</li> <li>13. Solve problems using the area of triangles.</li> <li>14. Solve problems using the area of trapezia (H).</li> <li>15. Solve problems using the mean.</li> <li>16. Explore multiplication and division in algebraic expressions (H).</li> </ol>	<p><b>Next</b></p> <p>7.9 Fractions and percentage of an amount</p> <p>7.10 Operations with directed numbers</p> <p>7.11 Add and subtract fractions</p> <p>7.12 Multiply and divide fractions</p> <p>8.1 Ratio and Scale</p> <p>8.2 Multiplicative Change</p> <hr/> <p><b>New</b></p> <p>Calculating mean</p> <p>Multiplying by decimals</p> <p>Area of parallelograms and trapezia</p> <p>Algebraic multiplication</p> <p>Multiplying and dividing by the powers of ten</p> <hr/> <p><b>Prior</b></p> <p>Area of basic shapes</p> <p>Listing multiples and factors</p> <p>Formal methods of multiplication and division</p> <p>Order of operations</p> <p>Metric conversions</p>	<ul style="list-style-type: none"> <li>• Product</li> <li>• Inverse</li> <li>• Multiple</li> <li>• Factor</li> <li>• Integer</li> <li>• Decimal</li> <li>• Area</li> <li>• Chunking</li> <li>• Divisor</li> </ul>	<p><b>Excelling</b></p> <p>1.2 I can find the area of shapes with algebraic expressions.</p> <p>1.2 I can multiply &amp; divide in standard form, without converting.</p> <p>1.2 I can calculate the mean with algebra.</p> <p><b>Exceeding</b></p> <p>2.2 I can find the area of shapes with decimals &amp; fractions.</p> <p>2.2 I can calculate the mean with decimals/fractions.</p> <p>2.3 I can explain whether an answer is reasonable.</p> <p>2.4 I can solve problems involving area.</p> <p><b>Expected</b></p> <p>3.2 I can find the area of shapes with integers.</p> <p>3.2 I can calculate the mean with integers.</p> <p><b>Emerging</b></p> <p>4.2 I can use mental &amp; formal methods for multiplying and dividing with integers.</p> <p>4.2 I can use pictorial representations for multiplying &amp; dividing.</p>
	<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Use of money and money facts to show change in percentages and fractions</li> <li>• Cooking and baking- fractions of amounts and scaling/proportion</li> </ul>	<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Using column method for two digit by two digit multiplication – Explore alternative methods such as grid method</li> <li>• Understanding the order of operations (not BIDMAS) such as understanding that addition and subtraction the order does not matter</li> <li>• Calculating mean – when 0 is included in data, to ensure that the frequency of the number is included in the division</li> </ul>		

# Unit: 7.9

# Fractions and percentages of amounts

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Find a fraction of a given amount.</li> <li>2. Use a given fraction to find the whole and/or other fractions.</li> <li>3. Find a percentage of a given amount using mental methods.</li> <li>4. Find a percentage of a given amount using a calculator.</li> <li>5. Solve problems with fractions greater than 1 and percentages greater than 100% (H).</li> </ol>	<p><b>Next</b></p> <p>7.12 Multiply and divide fractions 8.2 Multiplicative Change 8.9 Fractions and Percentages</p>	<ul style="list-style-type: none"> <li>• Chunking</li> <li>• Divisor</li> <li>• Decrease</li> <li>• Equal</li> <li>• Equivalent</li> <li>• Increase</li> <li>• Multiplier</li> <li>• Part</li> <li>• Unit fraction</li> <li>• Whole</li> </ul>	<p><b>Excelling</b></p> <p>1.4 I can plan and solve multi-step problems involving both fractions and decimals. 1.4 I can plan and solve problems involving both fractions and percentages greater than 100%.</p> <p><b>Exceeding</b></p> <p>2.2 I am able to calculate non unit fractions and more complicated percentages of amounts without a calculator. 2.2 I can use a calculator to find fractions and percentages of an amount.</p> <p><b>Expected</b></p> <p>3.2 I can calculate the fraction of an amount using pictorial representations. 3.2 I can find simple percentages mentally.</p> <p><b>Emerging</b></p> <p>4.2 Calculate unitary fractions of an amount 4.3 Make links between fractions and pictorial representations.</p>
		<p><b>New</b></p> <p>Using a scientific calculator to find percentages, percentage increase and decrease and using a decimal multiplier. Problem solving with fractions and percentages greater than 1 or 100%</p>		
		<p><b>Prior</b></p> <p>Finding a percentage or fraction of an amount Use a given fraction to find the whole fraction</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Financial maths such as calculating VAT</li> <li>• Percentage increase or decrease of assets (growth and decay)</li> <li>• Compound measures</li> <li>• Sharing Bills</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• <math>0.3 = 3\%</math></li> <li>• <math>1/3 = 0.3</math></li> <li>• Using the most efficient method for calculating percentages with a calculator</li> <li>• When comparing values to convert all values to the same format</li> </ul>	

# Unit: 7.10

# Operations and equations with directed numbers

Time Allocation	Skills and Knowledge	Where Learning Sits	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Understand and use representations of directed numbers.</li> <li>2. Order directed numbers using lines and appropriate symbols.</li> <li>3. Perform calculations that cross zero.</li> <li>4. Add directed numbers.</li> <li>5. Subtract directed numbers.</li> <li>6. Multiplication of directed numbers.</li> <li>7. Multiplication and division of directed numbers.</li> <li>8. Use calculator for directed number calculations.</li> <li>9. Evaluate algebraic expressions with directed number.</li> <li>10. Introduction to two-step equations.</li> <li>11. Solve two-step equations.</li> <li>12. Use order of operations with directed numbers.</li> <li>13. Roots of positive numbers (H).</li> <li>14. Explore higher powers and roots (H).</li> </ol>	<p><b>Next</b></p> <p>7.17 Working in the Cartesian Plane Brackets, Equations and Equivalence 8.5 Sequences 8.7 Indices 8.8 Number Sense</p>	<ul style="list-style-type: none"> <li>• Ascending</li> <li>• Descending</li> <li>• <b>Decrease</b></li> <li>• Difference</li> <li>• <b>Increase</b></li> <li>• Inverse</li> <li>• <b>Minus</b></li> <li>• Multiply</li> <li>• <b>Negative</b></li> <li>• <b>Positive</b></li> <li>• Powers and roots</li> <li>• <b>Product</b></li> <li>• <b>Square number</b></li> </ul>	<p><b>Excelling</b></p> <p>1.3 I can use checking methods to justify if my solution is correct.</p> <p><b>Exceeding</b></p> <p>2.2 I can solve 1 &amp; 2 step equations with negative solutions. 2.3 I can explain how to raise a number to a power or how to find a root.</p> <p><b>Expected</b></p> <p>3.2 I can substitute negative numbers into expressions. 3.2 I can perform operations with negative numbers.</p> <p><b>Emerging</b></p> <p>4.2 I can compare &amp; order directed numbers.</p>
		<p><b>New</b></p> <p>Calculating squares and square roots Solving two step equations Multiplying and dividing directed numbers</p>		
		<p><b>Prior</b></p> <p>Solving one step equations (Unit 7.3) Ordering and comparing directed numbers Calculations that cross zero on a number line</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Weather such as interpreting temperature</li> <li>• Time such as understanding splits (in sport)</li> <li>• Foundational numerical skills for all jobs</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Negative and Minus – understanding the difference between these key words. Understanding that one is a operation.</li> <li>• Thinking that positive numbers have only one square root</li> </ul>	

# Unit: 7.11 Add and Subtract Fractions

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Understand representations of fractions.</li> <li>2. Convert between mixed numbers and fractions.</li> <li>3. Add and subtract unit fractions with the same denominator.</li> <li>4. Add and subtract fractions with the same denominator.</li> <li>5. Add and subtract fractions from integers expressing the answer as a single fraction.</li> <li>6. Understand and use equivalent fractions.</li> <li>7. Add and subtract fractions where denominators share a simple common multiple.</li> </ol>	<p><b>Next</b></p> <p>7.15 Sets and Probability 8.4 Tables and Probability 8.9 Fractions and Percentages</p>	<ul style="list-style-type: none"> <li>• Add</li> <li>• Common</li> <li>• <b>Denominator</b></li> <li>• Divide</li> <li>• <b>Equivalent</b></li> <li>• <b>Factor</b></li> <li>• <b>Improper Fraction</b></li> <li>• <b>Integer</b></li> <li>• Interchange</li> <li>• <b>LCM</b></li> <li>• <b>Mixed Number</b></li> <li>• Multiple</li> <li>• Multiply</li> <li>• <b>Numerator</b></li> <li>• <b>Proper Fraction</b></li> <li>• Subtract</li> <li>• <b>Terminating Fraction</b></li> <li>• Whole</li> </ul>	<p><b>Excelling</b></p> <p>1.2 I can add and subtract algebraic fractions. 1.3 I can explain equivalent algebraic fractions. 1.3 I can justify the strategies used when solving problems with fractions.</p> <p><b>Exceeding</b></p> <p>2.3 I can perform &amp; explain operations with a combination of FDP. 2.2 I can add &amp; subtract fractions with different denominators. 2.2 I can add &amp; subtract improper fractions &amp; mixed numbers .</p> <p><b>Expected</b></p> <p>3.2 I can add &amp; subtract fractions where the denominators share a common multiple. 3.2 I can convert FDP when some denominators need converting. 3.2 I can calculate the fraction of an amount using pictorial representations.</p> <p><b>Emerging</b></p> <p>4.2 I can convert between mixed numbers &amp; improper fractions. 4.2 I can add &amp; subtract fractions with the same denominator. 4.2 I can find simple equivalent fractions.</p>
	<ol style="list-style-type: none"> <li>8. Add and subtract fractions with any denominator.</li> <li>9. Add and subtract improper fractions and mixed numbers.</li> <li>10. Use fractions in algebraic contexts.</li> <li>11. Add and subtract simple algebraic fractions (H).</li> <li>12. Use fractions in algebraic contexts.</li> <li>13. Use equivalence to add and subtract decimals and fractions.</li> <li>14. Add and subtract simple algebraic fractions (H).</li> </ol>	<p><b>New</b></p> <p>Adding and subtracting fractions with decimals or percentages Adding and subtracting mixed and improper fractions Adding and subtracting algebraic fractions</p>		
		<p><b>Prior</b></p> <p>Representing fractions Equivalent fractions Add and subtract fractions with the same and different denominators</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Engineering</li> <li>• Catering/Chef</li> <li>• Building and construction</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Add the denominator when adding</li> <li>• Forget to make the denominator the same</li> <li>• Confusing process of + - with <math>\times \div</math></li> </ul>	

# Unit 7.12: Multiplying and Dividing Fractions

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language		What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Represent multiplication of fractions.</li> <li>2. Multiply a fraction by an integer.</li> <li>3. Find the product of a pair of unit fractions.</li> <li>4. Find the product of a pair of any fractions.</li> <li>5. Divide an integer by a fraction.</li> <li>6. Divide a fraction by a unit fraction.</li> <li>7. Understand and use the reciprocal.</li> <li>8. Divide any pairs of fractions.</li> </ol>	<p><b>Next</b></p> <p>7.15 Sets and Probability 7.17 Working in the Cartesian Plane 8.4 Tables and Probability 8.14 Area of Circle and Trapezia</p>	<ul style="list-style-type: none"> <li>• Cancel</li> <li>• Commutative</li> <li>• Convert</li> <li>• <b>Denominator</b></li> <li>• Estimate</li> <li>• Expression</li> <li>• <b>Factor</b></li> <li>• Generalise</li> <li>• <b>Improper fraction</b></li> <li>• Integer</li> <li>• <b>Mixed number</b></li> <li>• <b>Numerator</b></li> <li>• Part</li> <li>• Product</li> <li>• Proper Fraction</li> <li>• Quotient</li> <li>• Reciprocal</li> <li>• Repeated addition</li> </ul>	<ul style="list-style-type: none"> <li>• Simplest form</li> <li>• Simplify</li> <li>• Square</li> <li>• Term</li> <li>• Unit fraction</li> <li>• Whole number</li> </ul>	<p><b>Excelling</b></p> <p>1.2 I can multiply and divide with algebraic fractions. 1.3 I can explain what a reciprocal is and use it in context. 1.3 I can justify the strategies used when solving problems with fractions.</p> <p><b>Exceeding</b></p> <p>2.1 I can identify reciprocals. 2.4 I can solve problems involving multiplying &amp; dividing with fractions.</p> <p><b>Expected</b></p> <p>3.2 I can multiply &amp; divide proper fractions &amp; integers. 3.2 I can multiply &amp; divide improper fractions &amp; mixed numbers.</p> <p><b>Emerging</b></p> <p>4.2 I can convert between mixed numbers &amp; improper fractions. 4.2 I can multiply &amp; divide with a unitary fraction and an integer. 4.2 I can find simple equivalent fractions.</p>
	<ol style="list-style-type: none"> <li>9. Multiply and divide improper and mixed fractions (H).</li> <li>10. Multiply and divide algebraic fractions (H).</li> </ol>	<p><b>New</b></p> <p>Understanding reciprocals Multiply and divide improper and mixed fractions Multiply and divide algebraic fractions</p>			
		<p><b>Prior</b></p> <p>Representing fractions Operations with unit fractions Multiply and divide fractions</p>			
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Bar modelling.</li> <li>• Bead representations.</li> <li>• Reading the time from analogue and digital clocks.</li> <li>• Planning journey times.</li> <li>• These are used in banking, interest rates.</li> <li>• Healthcare professionals use these in calculating medication amounts.</li> <li>• Used in farming and animal care for food and medication.</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Thinking they must have a common denominator to multiply or divide a fraction.</li> <li>• Not converting mixed fractions to improper fractions before multiplying or dividing</li> </ul>		

# Unit: 7.13: Construction and Measure

Time Allocation	Skills and Knowledge	Where Learning Sits	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Understand and use letters and labelling conventions including those for geometric figures.</li> <li>2. Draw and measure line segments including geometric figures.</li> <li>3. Understand angles as a measure of turn.</li> <li>4. Classify angles.</li> <li>5. Measure angles up to 180°.</li> <li>6. Draw angles up to 180°.</li> <li>7. Draw and measure angles between 180° and 360°.</li> <li>8. Identify perpendicular and parallel lines.</li> <li>9. Recognise types of triangle.</li> <li>10. Recognise types of quadrilateral.</li> <li>11. Identify polygons up to a decagon.</li> <li>12. Construct triangles using SSS.</li> <li>13. Construct triangles using SSS, SAS and ASA.</li> <li>14. Construct more complex polygons.</li> <li>15. Interpret simple pie charts using proportion.</li> <li>16. Interpret pie charts using a protractor.</li> <li>17. Draw pie charts.</li> </ol>	<p><b>Next</b></p> <p>7.14 Geometric Reasoning 8.12 Angles in Parallel lines 8.14 Symmetry, Reflection and Rotation</p>	<ul style="list-style-type: none"> <li>• Acute</li> <li>• Angle</li> <li>• Angle Sum</li> <li>• Degree</li> <li>• Diameter</li> <li>• Edge</li> <li>• Exterior</li> <li>• Height</li> <li>• Interior</li> <li>• Length</li> <li>• Line segment</li> <li>• Obtuse</li> <li>• Perpendicular</li> <li>• Parallel</li> <li>• Polygon</li> <li>• Quadrilateral</li> <li>• Sector</li> <li>• Scale Factors</li> </ul>	<p><b>Excelling</b></p> <p>1.2 I can construct complex polygons. 1.3 I can justify triangle congruence using SSS, SAS, ASA. 1.3 I can interpret and compare pie charts.</p> <p><b>Exceeding</b></p> <p>2.2 I can construct triangles using SSS, SAS, ASA properties. 2.2 I can draw pie charts accurately.</p> <p><b>Expected</b></p> <p>3.2 I can use a protractor to draw and measure angles. 3.1 I can recognise parallel and perpendicular lines. 3.3 I can recognise and describe all quadrilaterals and polygons to 10 sided. 3.2 I can use formal letter notation for lines &amp; angles.</p> <p><b>Emerging</b></p> <p>4.3 I can recognise and describe basic angles, common triangles and quadrilaterals. 4.3 I can make links between pictures and fractions. 4.2 I can use a ruler to draw and measure.</p>
		<p><b>New</b></p> <p>Labelling conventions for line segment, shapes and angles Constructing SSS, SAS and ASA triangles Interpreting pie charts Identifying perpendicular and parallel lines Constructing more complex polygons</p>		
		<p><b>Prior</b></p> <p>Classifying and identifying types of angles Identifying polygons Using a protractor</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Architecture.</li> <li>• Building and design.</li> <li>• Model making.</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Using the incorrect scales on a protractor.</li> <li>• Not using a protractor and compass correctly</li> <li>• Removing construction lines from ASA/SAS/SSS triangles</li> <li>• Using frequency as the angles for constructing pie charts</li> </ul>	

# Unit: 7.14: Geometric Reasoning

Time Allocation	Skills and Knowledge	Where Learning Sits	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<b>4 lessons</b>	<ol style="list-style-type: none"> <li>1. Understand and use the sum of angles at a point.</li> <li>2. Understand and use the sum of angles on a straight line.</li> <li>3. Understand and use the equality of vertically opposite angles.</li> <li>4. Know and apply the sum of angles in a triangle.</li> <li>5. Know and apply the sum of angles in a quadrilateral.</li> <li>6. Solve angle problems using properties of triangles and quadrilaterals.</li> <li>7. Solve complex angle problems.</li> <li>8. Find and use the angle sum of any polygon (H).</li> <li>9. Investigate angles in parallel lines (H).</li> <li>10. Understand and use parallel line angle rules (H).</li> <li>11. Use known facts to obtain simple proofs (H).</li> </ol>	<p><b>Next</b> 8.5 Brackets, equations and equalities 8.12 Angles on parallel lines 8.14 Symmetry, Reflection and Rotation</p> <hr/> <p><b>New</b> Interior and exterior angles for polygons Relationships on angles on parallel lines</p> <hr/> <p><b>Prior</b> Angles on a straight line and around a point Vertically opposite angles</p>	<ul style="list-style-type: none"> <li>• Acute</li> <li>• <b>Alternative</b></li> <li>• Angle</li> <li>• <b>Co-interior</b></li> <li>• Concave</li> <li>• Convex</li> <li>• Conjecture</li> <li>• Intercept</li> <li>• Irregular</li> <li>• Obtuse</li> <li>• Parallel</li> <li>• Perpendicular</li> <li>• Polygon</li> <li>• Reflex</li> <li>• <b>Regular</b></li> <li>• <b>Supplementary</b></li> <li>• Transversal</li> <li>• <b>Vertically Opposite</b></li> </ul>	<p><b>Excelling</b> 1.4 I can investigate angles in parallel lines. 1.2 I can find and use the sum of polygons formula. 1.3 I can understand and explain parallel line angle rules. 1.4 I can use algebra with known facts to obtain simple proofs.</p> <p><b>Exceeding</b> 2.3 I can explain angle reasoning formally. 2.4 I can use angle facts to solve problems.</p> <p><b>Expected</b> 3.1 I can recognise parallel and perpendicular lines. 3.2 I can recall and apply basic angle facts.</p> <p><b>Emerging</b> 4.1 I can recognise &amp; describe basic angle facts, common triangles and quadrilaterals.</p>
<b>Real-life applications and Problem Solving</b>			<b>Misconceptions</b>	
<ul style="list-style-type: none"> <li>• Architecture.</li> <li>• Building and design.</li> <li>• Model making.</li> </ul>			<ul style="list-style-type: none"> <li>• The angle sum of a convex and a concave polygon of equal side numbers is not the same.</li> <li>• Angles on parallel lines must always work in pairs (only exactly two are the same)</li> </ul>	

# Unit: 7.15: Sets and probability

Time Allocation	Skills and Knowledge	Where Learning Sits	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Identify and represent sets.</li> <li>2. Interpret and create Venn diagrams.</li> <li>3. Understand and use intersections of sets.</li> <li>4. Understand and use the union of sets.</li> <li>5. Understand and use the complement of a set (H).</li> <li>6. Know and use the vocabulary of probability.</li> <li>7. Generate sample spaces for single events.</li> <li>8. Calculate the probability of a single even.</li> <li>9. Understand and use the probability scale.</li> <li>10. Know that the sum of probabilities of all possible outcomes is 1.</li> </ol>	<p><b>Next</b></p> <p>8.4 Tables and Probability 8.9 Fractions and Percentages 8.15 The Data Handling Cycle</p>	<ul style="list-style-type: none"> <li>• And Or rules</li> <li>• Bias</li> <li>• Certain</li> <li>• Compliment</li> <li>• Carole Diagram</li> <li>• Decimals</li> <li>• Element</li> <li>• Fractions</li> <li>• Impossible</li> <li>• <b>Intersection</b></li> <li>• Likelihood</li> <li>• Mutually exclusive</li> <li>• <b>Outcome</b></li> <li>• <b>Possibilities</b></li> <li>• Probability</li> <li>• Sample Space Diagram</li> <li>• <b>Set</b></li> <li>• Simplify</li> <li>• <b>Union</b></li> <li>• Universal</li> </ul>	<p><b>Excelling</b></p> <p>1.2 I can understand and use compliments. 1.3 I can explain why yes/no outcomes aren't even chance. 1.5 I can use probability language fluently.</p> <p><b>Exceeding</b></p> <p>2.3 I can explain intersections &amp; unions. 2.3 I can find and explain exhaustive lists (sample space diagram for single event). 2.3 I can understand and use probability scales with estimates of increments.</p> <p><b>Expected</b></p> <p>3.2 I understand and can use intersections and unions, including notation. 3.3 I can interpret and create Venn diagrams. 3.1 I can use Venn to identify and represent sets, find simple probabilities. 3.2 I can list some outcomes. 3.1 I know the sum of probabilities is 1. 3.2 I can understand &amp; use basic probability scales.</p> <p><b>Emerging</b></p> <p>4.1 I know and use probability language. 4.2 I can find simple probability.</p>
	<p><b>New</b></p> <p>Calculating probability from a Venn diagram Venn diagram notation Probability from a sample space diagram</p>	<p><b>Prior</b></p> <p>Describing probability Listing probabilities on a number line Basic probability terminology Understanding that probability equals to one Interpreting Venn diagrams</p>		
	<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Marketing</li> <li>• Data Analysis including understanding similarities and differences between collected data</li> <li>• Sport Statistics</li> <li>• Weather</li> </ul>			



# Unit: 7.16: Prime Numbers and Proof

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Find and use multiples</li> <li>2. Identify factors of numbers and expressions</li> <li>3. Recognise and identify prime numbers</li> <li>4. Recognise square and triangular numbers</li> <li>5. Find common factors of a set of numbers</li> <li>6. Find common multiples of a set of numbers</li> <li>7. Write a number as a product of it's prime factors</li> <li>8. Use a Venn diagram to calculate HCF and LCM</li> <li>9. Make and test conjectures</li> <li>10. Use counter examples to disprove a conjecture</li> </ol>	<p><b>Next</b></p> <p>8.6 Prime Numbers and Proof 8.8 Indices 9.2 Testing Conjectures</p>	<ul style="list-style-type: none"> <li>• Factors</li> <li>• Multiples</li> <li>• Prime</li> <li>• Square</li> <li>• Triangular</li> <li>• Common</li> <li>• Conjecture</li> <li>• Example</li> <li>• Counter-example</li> <li>• Disapprove</li> <li>• Theory</li> </ul>	<p><b>Excelling</b></p> <p>1.2 I can apply understanding of HCF and LCM in integers to both fractions and algebra. 1.3 I can use numerical equivalence to explore conjectures and explain if they are correct or not.</p> <p><b>Exceeding</b></p> <p>2.2 I can calculate the HCF and LCM of two or more numbers using prime factorisation. 2.3 I can use Venn Diagrams to calculate the HCF and LCM and explain how to populate the diagrams. 2.3 I can use proof by counterexample to explain that a conjecture is not true.</p> <p><b>Expected</b></p> <p>3.3 I can use listing to calculate HCF and LCM of two or more numbers. 3.2 I can disprove some conjectures using number properties.</p> <p><b>Emerging</b></p> <p>4.1 I can recall number facts including primes, factors, squares and cubes or know how to calculate them.</p>
		<p><b>New</b></p> <p>Finding HCF &amp; LCM from a Venn Diagram Factors of algebraic expressions</p>		
		<p><b>Prior</b></p> <p>Listing multiples Listing factors Calculating square numbers</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Justifying answers with mathematical reasoning</li> <li>• Presenting and verbally explaining mathematical ideas</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Understanding the difference between multiples and factors</li> <li>• One is not a prime number</li> <li>• Factors must be integers</li> <li>• Placing values correctly into a Venn diagram</li> </ul>	

# Unit 7.17: Working in the Cartesian Plane

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>6 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Work with coordinates in all four quadrants.</li> <li>2. Identify and draw lines that are parallel to the axis.</li> <li>3. Recognise and use the line <math>y=x</math>.</li> <li>4. Recognise and use lines in the form <math>y=kx</math>.</li> <li>5. Link <math>y=kx</math> to direct proportion problems.</li> <li>6. Explore the gradient of the line <math>y=kx</math> (H).</li> <li>7. Recognise and use lines of the form <math>y = x+a</math>.</li> <li>8. Explore graphs with negative gradient (<math>y=-kx</math>, <math>y=a-x</math>, <math>x+y=a</math>).</li> </ol>	<p><b>Next</b></p> <p>8.3 Representing Data 8.7 Sequences 8.15 The Data Handling Cycle 8.17 Straight Line Graphs</p>	<ul style="list-style-type: none"> <li>• Quadrant</li> <li>• Coordinates</li> <li>• Axis</li> <li>• Origin</li> <li>• Parallel</li> <li>• Straight Line</li> <li>• <b>Horizontal</b></li> <li>• <b>Vertical</b></li> <li>• <b>Gradient</b></li> <li>• Steepness</li> <li>• Slope</li> <li>• <b>Intercept</b></li> <li>• Positive</li> <li>• Negative</li> <li>• <b>Equation</b></li> <li>• Table of Values</li> </ul>	<p><b>Excelling</b></p> <p>1.3 I can explain the impact of altering the <math>m</math> in <math>y = mx + c</math>. 1.3 I have explored non-linear graphs.</p>
	<ol style="list-style-type: none"> <li>9. Link graphs to linear sequences.</li> <li>10. Plot graphs of the form <math>y=mx+c</math>.</li> <li>11. Explore non-linear graphs (H).</li> <li>12. Find the mid-point of a line segment (H).</li> </ol>	<p><b>New</b></p> <p>Calculating gradient Identifying lines in the format <math>x/y=k</math> and <math>y=kx</math> Identifying <math>y</math>-intercept Exploring lines with a negative gradient Plotting graphs in the format <math>y=mx+c</math></p>		<p><b>Exceeding</b></p> <p>2.2 I can draw graphs in the form <math>y=mx + c</math> 2.3 I can explain the impact of altering the <math>y</math>-intercept in <math>y = mx + c</math>.</p> <p><b>Expected</b></p> <p>3.1 I can recognise lines parallel to the axes. 3.2 I can draw graphs in the form <math>y = x + a</math></p>
		<p><b>Prior</b></p> <p>Identifying <math>x</math> and <math>y</math> axis Plotting coordinates Recognise parallel lines Linear sequences</p>		<p><b>Emerging</b></p> <p>4.2 I can plot and read coordinates in all 4 quadrants.</p>
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Data analysis – Understanding relationships with graphs</li> <li>• Representing data</li> <li>• Understanding correlations</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Gradient is change over <math>y</math>/change over <math>x</math></li> <li>• Identifying a gradient by the direction of the line</li> <li>• Squaring negative numbers</li> </ul>	

# Year 8

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7		Week 8	Week 9	Week 10
Ratio and Scale		Multiplicative Change		Representing Data		Tables and Probability	<b>October Break</b>	Number Sense		Brackets, Equations and Equivalence
Week 11	Week 12	Week 13	Week 14			Week 15	Week 16	Week 17	Week 18	Week 19
Brackets, Equations and Equivalence	Assessment Week	Prime Numbers and Proof		<b>Christmas Break</b>	<b>Christmas Break</b>	Sequences		Indices		Fractions and Percentages
Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26	Week 27			Week 28
Fractions and Percentages	<b>February Break</b>	Standard Form		Assessment Week	Angles in Parallel Lines			<b>Easter Break</b>	<b>Easter Break</b>	Areas of Circles and Trapezia
Week 29	Week 30	Week 31	Week 32	Week 33		Week 34	Week 35	Week 36	Week 37	Week 38
Areas of Circles and Trapezia	Symmetry, Reflection and Rotation		The data handling cycle		<b>May Break</b>	Measures of Location		A. Week	Straight line graphs	

# Unit: 8.1

# Ratio and Scale

Time Allocation `	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language		What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Understand the meaning and representation of ratio.</li> <li>2. Understand and use ratio notation.</li> <li>3. Solve problems involving ratios of the form 1:n (or n:1)</li> <li>4. Solve proportional problems involving the ratio m:n.</li> <li>5. Divide a value into a given ratio.</li> <li>6. Express ratios in their simplest integer form.</li> <li>7. Express ratios in the form 1:n (H).</li> <li>8. Compare ratios and related fractions.</li> <li>9. Understand <math>\pi</math> as the ratio between diameter and circumference.</li> <li>10. Understand gradient as a ratio</li> </ol>	<p><b>Next</b></p> <ul style="list-style-type: none"> <li>8.2 Multiplicative Change</li> <li>8.11 Number Sense</li> <li>8.16 Measures of location</li> <li>9.11 Ratio and Proportion</li> <li>9.12 Rates of Change</li> <li>9.13 Enlargement and Similarity</li> </ul>	<ul style="list-style-type: none"> <li>• Algebra</li> <li>• Circles</li> <li>• Circumference</li> <li>• Colon (:)</li> <li>• Common factor</li> <li>• Compare</li> <li>• Denominator</li> <li>• Divide</li> <li>• Equal Parts</li> <li>• Equivalent</li> <li>• Fractions</li> <li>• Gradient</li> <li>• Label</li> <li>• Multiplier</li> <li>• Multiply</li> <li>• Number line</li> <li>• Numerator</li> <li>• Order</li> <li>• Part</li> <li>• Proportion</li> <li>• Ratio</li> <li>• Relationship</li> </ul>	<ul style="list-style-type: none"> <li>• Scale</li> <li>• <b>Scale Factor</b></li> <li>• Share</li> <li>• Simplify</li> <li>• Total</li> <li>• Units</li> </ul>	<p><b>Excelling</b></p> <ul style="list-style-type: none"> <li>1.1 I can simplify algebraic ratios</li> <li>1.2 I can compare ratios and their related fractions.</li> <li>1.3 I can explain fluently how to solve complex ratio problems.</li> </ul> <p><b>Exceeding</b></p> <ul style="list-style-type: none"> <li>2.4 I can solve problems using ratios in the form 1:n and n:1.</li> <li>2.3 I can explain the links between ratios and fractions.</li> </ul> <p><b>Expected</b></p> <ul style="list-style-type: none"> <li>3.2 I can simplify ratios.</li> <li>3.2 I can write ratios in the form 1:n or n:1.</li> <li>3.2 I can divide a quantity into a given ratio.</li> </ul> <p><b>Emerging</b></p> <ul style="list-style-type: none"> <li>4.1 I can recall key facts about ratio.</li> <li>4.2 I can represent ratios pictorially.</li> </ul>
		<p><b>New</b></p> <ul style="list-style-type: none"> <li>Writing ratios in the format n:1</li> <li>Comparing ratios to fractions</li> <li>Represent gradient as a ratio</li> </ul>			
		<p><b>Prior</b></p> <ul style="list-style-type: none"> <li>This is the first ratio unit in KS3 Maths – Please be aware</li> <li>Dividing to find a part/whole of an amount</li> <li>Finding a fraction of an amount</li> </ul>			
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Bar modelling for problem solving</li> <li>• Pie charts</li> <li>• Garden design and loci - landscaping</li> <li>• Colour mixing – decorating, hairdressing, arts</li> <li>• Catering – scaling up for functions.</li> <li>• Wildlife surveys – conservation.</li> <li>• Flag design (cross curricular Geography)</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Using ratios to answer probability questions – this is not suitable.</li> <li>• Fractions and decimals cannot be used in ratios – they can when using the form 1:n.</li> </ul>		

# Unit: 8.2

# Multiplicative Change

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Solve problems involving direct proportion.</li> <li>2. Explore conversion graphs.</li> <li>3. Convert between currencies.</li> <li>4. Explore direct proportion graphs (H).</li> <li>5. Explore relationships between similar shapes.</li> <li>6. Understand scale factors as multiplicative representations.</li> <li>7. Draw and interpret scale diagrams.</li> <li>8. Interpret maps using scale factors and ratios.</li> </ol>	<p><b>Next</b></p> <p>8.3 Representing Data 8.7 Sequences 8.9 Fractions and Percentages 8.11 Number Sense 9.11 Ratio and Proportion 9.12 Rates of Change 9.13 Enlargement and Similarity</p> <hr/> <p><b>New</b></p> <p>Defining and identifying direct proportion Interpreting conversion graphs Converting currencies</p> <hr/> <p><b>Prior</b></p> <p>Diving and sharing by a ratio Understanding ratio Converting between ratio and fraction Scale diagrams on maps</p>	<ul style="list-style-type: none"> <li>• Approximation</li> <li>• Axes</li> <li>• Axis</li> <li>• Constant</li> <li>• <b>Conversions</b></li> <li>• Corresponding</li> <li>• Directly</li> <li>• Distance</li> <li>• <b>Enlargement</b></li> <li>• Image</li> <li>• Imperial</li> <li>• <b>Inversely</b></li> <li>• Labelling</li> <li>• Length</li> <li>• Linear</li> <li>• Metric</li> <li>• Object</li> <li>• Orientation</li> <li>• Origin</li> <li>• Plan</li> <li>• <b>Proportion</b></li> <li>• Ratio</li> </ul>	<p><b>Excelling</b></p> <p>1.3 I can create a detailed scale drawing and justify the scales I have used. 1.3 I can explain what the gradient in a direct proportion graph means.</p> <p><b>Exceeding</b></p> <p>2.4 I can draw and use conversion graphs to solve problems. 2.4 I can use proportion to solve recipe problems. 2.2 I can create a detailed scale drawing.</p> <p><b>Expected</b></p> <p>3.1 I can multiply and divide with decimals. 3.2 I can use the unitary method to solve simple problems. 3.2 I can draw simple scale drawings. 3.2 I can draw conversion graphs.</p> <p><b>Emerging</b></p> <p>4.1 I can use mental and formal methods for multiplying and dividing. 4.1 I can plot and read coordinates accurately in 4 quadrants. 4.1 I can draw and measure accurately with a ruler.</p>
	<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Car design</li> <li>• Model making and the arts</li> <li>• Architecture</li> <li>• Catering</li> <li>• Holidaying – calculating the price of goods you are buying.</li> <li>• Reading and interpreting OS maps.</li> <li>• Bar modelling to problem solve.</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Do not realise that directly proportional graphs must go through the origin.</li> <li>• Graphs do not have to be straight lines.</li> <li>• Scales must be even but do not have to be the same on each axis.</li> <li>• Diagrams are not always drawn accurately or to scale.</li> <li>• Enlargement does not always mean to get bigger.</li> </ul>

# Unit 8.3

# Representing Data

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language		What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>Draw and interpret scatter graphs.</li> <li>Understand and describe linear correlation.</li> <li>Draw and use the line of best fit.</li> <li>Identify non-linear relationships.</li> <li>Identify different types of data.</li> <li>Read and interpret ungrouped frequency tables.</li> <li>Read and interpret grouped frequency tables.</li> <li>Represent grouped discrete data.</li> <li>Represent continuous data grouped into equal classes.</li> <li>Represent data in two-way tables.</li> </ol>	<p><b>Next</b></p> <p>8.4 Tables and probability 8.15 The Data handling cycle 8.17 Straight line graphs 9.15 Algebraic Representation</p>	<ul style="list-style-type: none"> <li>Axes</li> <li>Axis</li> <li>Bar Chart</li> <li>Class Boundary</li> <li>Continuous</li> <li>Coordinate</li> <li>Correlation</li> <li>Counted</li> <li>Discrete</li> <li>Estimate</li> <li>Extrapolate</li> <li>Frequency</li> <li>Greater than</li> <li>Less than</li> <li>Line of Best Fit</li> <li>Linear</li> <li>Measures</li> <li>Negative</li> <li>Origin</li> <li>Outlier</li> <li>Pie Chart</li> <li>Positive</li> </ul>	<ul style="list-style-type: none"> <li>Qualitative</li> <li>Quantitative</li> <li>Range</li> <li>Relationship</li> <li>Tally</li> <li>Variable</li> </ul>	<p><b>Excelling</b></p> <p>1.3 I can justify the line of best fit I have drawn and explain it's limitations. 1.3 I can describe a correlation in context. 1.3 I can justify and explain class boundaries for continuous data. 1.4 I can recognise and explain when a two-way table is useful to solve a problem.</p> <p><b>Exceeding</b></p> <p>2.2 I can draw and use a line of best fit. 2.2 I can recognise outliers and suggest reasons for them. 2.3 I can explain discrete/continuous and qualitative/quantitative means. 2.3 I can justify and explain class boundaries. 2.4 I can construct two-way tables and represent data in them.</p> <p><b>Expected</b></p> <p>3.2 I can draw scatter graphs 3.1 I can recognise different correlations. 3.2 I can classify data as discrete/continuous and qualitative/quantitative. 3.1 I understand what "frequency" means. 3.2 I can complete a two-way table.</p> <p><b>Emerging</b></p> <p>4.2 I can plot and read coordinates in all 4 quadrants. 4.2 I can use tally charts</p>
	<p><b>New</b></p> <p>Identifying non-linear relationships and graphs Categorising types of data Interpreting data from a grouped frequency table Representing data in a two way table</p>				
	<p><b>Prior</b></p> <p>Identifying and understanding correlations Plotting coordinates Drawing line of best fit Interpreting frequency tables</p>				
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>Sales predictions</li> <li>Planning orders</li> <li>Business Managers</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>The line of best fit does not need to go through the origin.</li> <li>The axes do not have to start at zero.</li> <li>The line of best fit does not join the crosses.</li> <li>The line of best fit does not have to be a straight line, but should have an equation.</li> <li>The bars/gaps do not have to be even in a bar chart.</li> <li>In frequency tables people tend to add the groups not the frequencies.</li> </ul>		

# Unit 8.4

# Tables and Probability

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>Construct sample spaces for 1 or more events.</li> <li>Find probabilities from a sample space.</li> <li>Find probabilities from two-way tables.</li> <li>Find probabilities from Venn diagrams.</li> <li>Use the product rule for finding the total number of possible outcomes (H).</li> </ol>	<p><b>Next</b></p> <p>8.9 Tables and Probability 8.15 The data handling cycle 9.6 Using percentages 9.14 Probability</p>	<ul style="list-style-type: none"> <li>And rule</li> <li>Chance</li> <li>Column</li> <li>Decimal</li> <li>Denominator</li> <li>Event</li> <li>Fraction</li> <li>Intersection</li> <li>Numerator</li> <li>Outcome</li> <li>Or rule</li> <li>Order</li> <li>P(event)</li> <li>Population</li> <li>Possibilities</li> <li>Probability</li> <li>Region</li> <li>Row</li> <li>Sample</li> <li>Sample Space</li> <li>Set</li> <li>Systematic</li> <li>Unbiased</li> <li>Union</li> <li>Venn diagram</li> </ul>	<p><b>Excelling</b></p> <p>1.2 I can use the product rule for total outcomes. 1.3 I can justify my choice of diagram used for probability problems and their design.</p> <p><b>Exceeding</b></p> <p>2.2 I can find probabilities from sample space diagrams. 2.2 I can find probabilities from a subset of a 2-way table. 2.2 I can find probabilities from Venn diagrams, using formal notation.</p> <p><b>Expected</b></p> <p>3.2 I can construct sample space diagrams. 3.2 I can construct &amp; represent data in 2 way tables. 3.3 I can explain intersections &amp; unions &amp; use their notation correctly. 3.3 I can interpret and create Venn diagrams in context.</p> <p><b>Emerging</b></p> <p>4.1 I know and use probability language. 4.2 I can find simple probability. 2.3 I can find and explain exhaustive lists (sample space diagram for single event).</p>
	<p><b>New</b></p> <p>Calculating probabilities from tables and diagrams Using the product rule to find the total number of possible outcomes Venn diagram notation</p>	<p><b>Prior</b></p> <p>Constructing sample space diagrams and two way tables Interpreting Venn diagrams Constructing Venn diagrams</p>		
	<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>Marketing</li> <li>Data Analysis including understanding similarities and differences between collected data</li> <li>Sport Statistics</li> <li>Weather</li> </ul>			

# Unit 8.5

# Number Sense

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Round numbers to a power of 10 and 1 significant figure (R).</li> <li>2. Round numbers to a given number of decimal places.</li> <li>3. Estimate the answer to a calculation.</li> <li>4. Understand and use error interval notation (H).</li> <li>5. Calculate using the order of operations (R).</li> <li>6. Calculate with money.</li> <li>7. Convert metric measures of length.</li> <li>8. Convert metric units of weight and capacity.</li> <li>9. Convert metric units of area (H).</li> <li>10. Convert metric units of volume (H).</li> <li>11. Solve problems involving time and the calendar.</li> </ol>	<p><b>Next</b></p> <p>8.16 Measures of location 9.2 3D Shapes 9.3 Construction and congruency 9.7 Money 9.12 Rates of change</p>	<ul style="list-style-type: none"> <li>• Area</li> <li>• Balance</li> <li>• Bound</li> <li>• Continuous</li> <li>• Credit</li> <li>• Debit</li> <li>• <b>Decimal Place</b></li> <li>• <b>Decimal Point</b></li> <li>• Deposit</li> <li>• Dimensions</li> <li>• Discrete</li> <li>• Estimate</li> <li>• Index</li> <li>• Indices</li> <li>• <b>Integer</b></li> <li>• <b>Interest</b></li> <li>• Nearest</li> <li>• Number line</li> <li>• Order</li> <li>• Over estimate</li> </ul>	<p><b>Excelling</b></p> <p>1.2 I can recognise upper and lower bounds and use them to create error intervals. 1.4 I can explain how to convert between metric units of area and volume in order to compare and order them.</p>
		<p><b>New</b></p> <p>Round to any significant figure Converting between metric areas and volumes Estimating expressions</p>	<ul style="list-style-type: none"> <li>• Perpendicular</li> <li>• Perimeter</li> <li>• Power</li> <li>• <b>Prefix</b></li> <li>• Priority</li> <li>• Root</li> <li>• <b>Round</b></li> <li>• Significant</li> <li>• Under estimate</li> <li>• Units</li> </ul>	<p><b>Exceeding</b></p> <p>2.2 I can calculate fractions and percentages with money both with &amp; without a calculator. 2.4 I can solve problems with length, weight and capacity in different units. 2.4 I can solve problems involving time and calendar calculations.</p>
		<p><b>Prior</b></p> <p>Rounding values of a power of ten, decimal place and one significant figure Applying order of operations Converting between metric lengths</p>		<p><b>Expected</b></p> <p>3.2 I can round numbers to a given significant figure &amp; use it to estimate answers. 3.2 I can share money into a given ratio. 3.2 I can calculate with mixed units for money. 3.4 I can solve problems with length, weight and capacity in the same units.</p> <p><b>Emerging</b></p> <p>4.1 I can recall basic facts regarding units of length, weight and capacity. 4.2 I can round numbers to powers of ten and a given decimal place. 4.2 I can use BIDMAS to answer questions.</p>
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Construction</li> <li>• Interior design</li> <li>• Graphic design</li> <li>• Financial Maths</li> <li>• Interpreting and problem solving with timetables</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Understanding the difference between rounding to a decimal place and significant figure</li> <li>• Applying inequality symbols to bounds</li> <li>• All metric conversions do not use 100</li> </ul>	



# Unit 8.6

# Brackets, Equations and Inequalities

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Form algebraic expressions.</li> <li>2. Use directed number with algebra.</li> <li>3. Multiply out a single bracket.</li> <li>4. Factorise into a single bracket.</li> <li>5. Expand multiple single brackets and simplify.</li> <li>6. Expand a pair of binomials (H).</li> <li>7. Solve equations, including with brackets.</li> <li>8. Form and solve equations with brackets.</li> <li>9. Understand and solve simple inequalities.</li> <li>10. Form and solve inequalities.</li> <li>11. Solve equations and inequalities with unknowns on both sided (H).</li> <li>12. Form and solve equations and inequalities with unknowns on both sided (H).</li> <li>13. Identify and use formulae, expressions, identities and equations.</li> </ol>	<p><b>Next</b></p> <p>8.7 Sequences 8.8 Indices 8.17 Straight line graphs 9.1 Forming and solving equations 9.11 Ratio and proportion 9.15 Algebraic Representation</p> <hr/> <p><b>New</b></p> <p>Expanding brackets Solving two step equations Solving equations with brackets Solving inequalities Solving equations with unknowns on both sides</p> <hr/> <p><b>Prior</b></p> <p>Interpreting algebraic expressions Function machines which contain algebra Solving one-step equations Interpreting inequalities Substituting values into an expression</p>	<ul style="list-style-type: none"> <li>• Balance</li> <li>• <b>Binomial</b></li> <li>• <b>Coefficient</b></li> <li>• Directed Number</li> <li>• Equivalent</li> <li>• <b>Expand</b></li> <li>• Expression</li> <li>• Factor</li> <li>• Factorise</li> <li>• Highest Common Factor (HCF)</li> <li>• Greater than</li> <li>• Identity</li> <li>• Less than</li> <li>• Like terms</li> <li>• Inequality</li> <li>• Negative</li> <li>• Positive</li> <li>• Product</li> <li>• <b>Quadratic</b></li> </ul>	<p><b>Excelling</b></p> <p>1.2 I can form &amp; solve equations &amp; inequalities with unknowns on both sides. 1.2 I can expand double brackets. 1.3 I can explain the difference between expressions, equations, formulae and identities.</p> <p><b>Exceeding</b></p> <p>2.2 I can form equations from words. 2.2 I can factorise into single brackets. 2.2 I can expand brackets and simplify expressions. 2.2 I can solve 1 &amp; 2 step equations with unknowns on both sides. 2.2 I can form &amp; solve inequalities. 2.2 I can identify expressions, equations, formulae and identities.</p> <p><b>Expected</b></p> <p>3.2 I can form expressions from words. 3.2 I can expand single brackets. 3.2 I can solve simple inequalities &amp; equations with brackets. 3.2 I can identify expressions &amp; equations.</p> <p><b>Emerging</b></p> <p>4.2 I can use function machines to create 1 step expressions. 4.2 I can solve 1 &amp; 2 step equations with integer solutions.</p>
	<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Quadratic equations are used in stunt calculations, parabolas.</li> <li>• Business Managers and Financial Analysts.</li> <li>• Computer Programmers</li> <li>• Research Scientists</li> <li>• Health Care Professionals.</li> <li>• Bar modelling.</li> <li>• Balance scales.</li> <li>• Algebra tiles and /or double sided counters are helpful when teaching this topic.</li> </ul>	<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• When substituting <math>ab</math> means <math>a \times b</math>, we do not simply replace the letter with the value.</li> <li>• Students often look to divide an expression only by 2 when looking for common factors.</li> <li>• Students often struggle to group together algebraic terms when there are powers involved.</li> </ul>		

# Unit: 8.7

# Prime numbers and proof

Time Allocation	Skills and Knowledge	Where Learning Sits	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Find and use multiples.</li> <li>2. Identify factors of numbers and expressions.</li> <li>3. Recognise and identify prime numbers.</li> <li>4. Recognise square and triangular numbers.</li> <li>5. Find common factors of a set of numbers including the HCF.</li> <li>6. Find common multiples of a set of numbers including the LCM.</li> <li>7. Write a number as a product of its prime factors.</li> <li>8. Use a Venn diagram to calculate the HCF and LCM (H).</li> </ol>	<p><b>Next</b></p> <p>8.11 Number Sense 9.5 Testing conjectures</p>	<ul style="list-style-type: none"> <li>• Conjecture</li> <li>• Counter Examples</li> <li>• Cube</li> <li>• Even</li> <li>• Factor</li> <li>• Factorise</li> <li>• Highest Common Factor (HCF)</li> <li>• Integers</li> <li>• Lowest Common Multiple (LCM)</li> <li>• Negative</li> <li>• Multiples</li> <li>• Odd</li> <li>• Positive</li> <li>• Prime</li> <li>• Product</li> <li>• Proof</li> <li>• Relationship</li> <li>• Remainder</li> <li>• Square</li> <li>• Sum</li> <li>• Triangular</li> <li>• Zero</li> </ul>	<p><b>Excelling</b></p> <p>1.2 I can apply understanding of HCF and LCM in integers to both fractions and algebra. 1.3 I can use numerical equivalence to explore conjectures and explain if they are correct or not.</p> <p><b>Exceeding</b></p> <p>2.2 I can calculate the HCF and LCM of two or more numbers using prime factorisation. 2.3 I can use Venn Diagrams to calculate the HCF and LCM and explain how to populate the diagrams. 2.3 I can use proof by counterexample to explain that a conjecture is not true.</p> <p><b>Expected</b></p> <p>3.3 I can use listing to calculate HCF and LCM of two or more numbers. 3.2 I can disprove some conjectures using number properties.</p> <p><b>Emerging</b></p> <p>4.1 I can recall number facts including primes, factors, squares and cubes or know how to calculate them.</p>
	<ol style="list-style-type: none"> <li>9. Make and test conjectures such as numerical/algebraic proof a prime is/is not a prime number</li> <li>10. Use counterexamples to disprove a conjecture.</li> </ol>	<p><b>New</b></p> <p>Testing conjectures Applying counter examples Finding HCF &amp; LCM using product of primes</p>		
		<p><b>Prior</b></p> <p>Listing factors and multiples Identifying prime, square and triangular numbers Finding prime factors Finding HCF and LCM</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Justifying answers with mathematical reasoning</li> <li>• Presenting and verbally explaining mathematical ideas</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Identifying zero or one as a prime number</li> <li>• Not applying number facts to identify a prime number such as using divisibility tests</li> <li>• Nothing can be split into two words NO THING – we know this more commonly as zero</li> </ul>	

# Unit 8.8

# Sequences

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Generate sequences given a rule in words.</li> <li>2. Generate sequences given a simple algebraic rule.</li> <li>3. Generate sequences given a complex algebraic rule.</li> <li>4. Finding a particular term within a linear and non-linear sequence</li> <li>5. Applying a proof to show if number is in a linear sequence</li> <li>6. Find the rule for the nth term of a linear sequence (H).</li> </ol>	<p><b>Next</b></p> <p>8.8 Indices 8.17 Straight line graphs 9.11 Ratio and Proportion 9.15 Algebraic Representation</p>	<ul style="list-style-type: none"> <li>• Algebraic</li> <li>• Bracket</li> <li>• <b>Coefficient</b></li> <li>• <b>Constant</b></li> <li>• <b>Difference</b></li> <li>• Expand</li> <li>• <b>Fibonacci</b></li> <li>• Integer</li> <li>• Linear</li> <li>• Sequence</li> <li>• Substitute</li> <li>• Position</li> <li>• Position-to-term</li> <li>• <b>Term</b></li> <li>• Term-to-term</li> </ul>	<p><b>Excelling</b></p> <p>1.3 I can prove whether a number is in a complex sequence or not. 1.3 I can find and justify the <math>n^{\text{th}}</math> term of a complex sequence.</p> <p><b>Exceeding</b></p> <p>2.3 I can justify whether a sequence is linear or not. 2.3 I can explain whether a number is in an algebraic sequence, or not. 2.2 I can generate complex sequences. 2.3 I can find and justify the <math>n^{\text{th}}</math> term of a linear sequence.</p> <p><b>Expected</b></p> <p>3.2 I can generate sequences. 3.3 I can recognise &amp; describe linear &amp; non-linear sequences. 3.3 I can explain whether a number is in a sequence or not.</p> <p><b>Emerging</b></p> <p>4.1 I can recognise all common sequences. 4.2 I can use BIDMAS to find the given terms in a sequence.</p>
	<p><b>New</b></p> <p>Non-linear sequences Sequences which contain indices Finding a particular term within a sequence Finding the nth term rule</p>			
	<p><b>Prior</b></p> <p>Writing sequences using algebraic notation. Substituting into expressions. Using different functions of a scientific calculator.</p>			
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Repayment of loans (linked into APR)</li> <li>• Engineering, specifically civil engineering, use sequences to design roads, bridges and other infrastructure.</li> <li>• Technical support and development</li> <li>• Sequences are used in games such as chess and draughts.</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Not understanding that the <math>n</math> in the sequencing expression represents number</li> <li>• To find a particular term of a sequence to substitute the value into the expression rather than writing out the sequence from the first term</li> </ul>	

# Unit 8.9

# Indices

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Calculating the value of basic indices (R)</li> <li>2. Adding and subtracting expressions with indices.</li> <li>3. Simplifying algebraic expressions by multiplying indices.</li> <li>4. Simplifying algebraic expressions by dividing indices.</li> <li>5. Using the addition law for indices.</li> <li>6. Using the addition and subtraction law for indices.</li> <li>7. Exploring powers of powers (H).</li> </ol>	<p><b>Next</b></p> <p>8.11 Standard Form 9.1 Forming and solving equations 9.15 Algebraic Representation</p>	<ul style="list-style-type: none"> <li>• Base</li> <li>• Coefficient</li> <li>• Denominator</li> <li>• Expand</li> <li>• Exponent</li> <li>• Expression</li> <li>• Factor</li> <li>• Index</li> <li>• Indices</li> <li>• Multiply</li> <li>• Numerator</li> <li>• Power(s)</li> <li>• Product</li> <li>• Simplify</li> <li>• Term</li> </ul>	<p><b>Excelling</b></p> <p>1.4 I can investigate the impact of raising a power by a power. 1.3 I can explain why the addition and subtraction laws work &amp; explain their limitations.</p> <p><b>Exceeding</b></p> <p>2.2 I can use the addition and subtraction laws for indices. 2.1 I know and can use <math>a^1 = a</math> and <math>a^0 = 1</math>.</p> <p><b>Expected</b></p> <p>3.5 I can use index number and base terminology fluently. 3.2 I can simplify expressions with indices <math>\neq 1</math>. 3.2 I can multiply and divide basic expressions with indices.</p> <p><b>Emerging</b></p> <p>4.1 I know square numbers to <math>15^2</math> and cube numbers to <math>5^3</math>. 4.5 I can use the language “squared” and “cubed” correctly.</p>
	<p><b>New</b></p> <p>Collecting like terms which contain indices Simplifying algebraic expressions which include multiplying and dividing Applying the laws of indices</p>			
	<p><b>Prior</b></p> <p>Calculating basic indices such <math>3^2</math> Identifying and collecting like terms Multiplying and dividing an integer by a term</p>			
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Foundational number skill to be able to calculate the value of indices</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Thinking <math>3^2</math> means <math>3 \times 2</math></li> <li>• Understanding that <math>b</math> and <math>b^2</math> cannot be simplifying</li> <li>• Understanding that <math>ab</math> and <math>ba</math> are similar terms</li> </ul>	

# Unit 8.10 Fractions & Percentages

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	1. Convert fluently between key fractions, decimals and percentages (R). 2. Calculate key fractions, decimals and percentages of an amount without a calculator (R). 3. Calculate fractions, decimals and percentages of an amount using calculator methods (R). 4. Convert between decimals and percentages greater than 100%.	<b>Next</b> 8.13 Area of circle and trapezia 8.15 The data handling cycle 8.16 Measures of location 9.4 Number 9.6 Using percentages 9.7 Money	<ul style="list-style-type: none"> <li>• Change</li> <li>• Conversion</li> <li>• Decimal</li> <li>• Denominator</li> <li>• Equivalent</li> <li>• Express</li> <li>• Fraction</li> <li>• Growth</li> <li>• Hundredth</li> <li>• Interest</li> <li>• Invest</li> <li>• Loss</li> <li>• Multiplier</li> <li>• Numerator</li> <li>• Original</li> <li>• Percentage</li> <li>• Profit</li> <li>• Reduce</li> <li>• Reverse</li> <li>• Rounding</li> <li>• Tenth</li> </ul>	<p><b>Excelling</b></p> 1.3 I can justify methods & strategies for solving complex percentage problems. 1.2 I can calculate the original amount given the percentage change. <p><b>Exceeding</b></p> 2.4 I can plan and solve problems involving both fractions and percentages greater than 100%. 2.3 I can justify & solve problems involving percentage change. <p><b>Expected</b></p> 3.2 I can use a calculator to find fractions and percentages of an amount, with & without a multiplier. 3.4 I can plan and solve problems involving both decimals and percentages less than 100%. 3.2 I can express one number as a fraction/percentage of another with & without a calculator. <p><b>Emerging</b></p> 4.2 I can convert FDP when some denominators need converting. 4.2 I can find simple percentages mentally.
	5. Percentage decrease with a multiplier. 6. Calculate percentage increase and decrease using a multiplier. 7. Express on number as a fraction or a percentage of another without a calculator. 8. Express on number as a fraction or a percentage of another using calculator methods. 9. Work with percentage change.	<b>New</b> Applying a decimal multiplier on a calculator Reverse percentages Calculating percentage change Identifying a range of methods to calculate percentage and find the most efficient		
	10. Choose appropriate methods to solve percentage problems. 11. Find the original amount given the percentage less than 100% (H). 12. Find the original amount given the percentage greater than 100% (H). 13. Choose appropriate methods to solve complex percentage problems (H).	<b>Prior</b> Finding a fraction or percentage of an amount Converting between fractions and percentages Using a calculator to find a percentage		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Bar modelling.</li> <li>• Bead representations.</li> <li>• Reading the time from analogue and digital clocks.</li> <li>• Planning journey times.</li> <li>• These are used in banking, interest rates.</li> <li>• Healthcare professionals use these in calculating medication amounts.</li> <li>• Used in farming and animal care for food and medication.</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Students often mix 1/3 up with 30% or 33%.</li> <li>• Thinking they must have a common denominator to multiply or divide a fraction.</li> <li>• Not converting mixed fractions to improper fractions before multiplying or dividing</li> </ul>	

# Unit 8.11

# Standard Index Form

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Investigate positive powers of 10.</li> <li>2. Work with numbers greater than 1 in standard form.</li> <li>3. Investigate negative powers of 10.</li> <li>4. Work with numbers between 0 and 1 in standard form.</li> <li>5. Compare and order number in standard form.</li> <li>6. Mentally calculate with numbers in standard form.</li> <li>7. Add and subtract numbers in standard form.</li> <li>8. Multiply and divide numbers in standard form.</li> <li>9. Use a calculator to work with numbers in standard form.</li> </ol>	<p><b>Next</b></p> <p>9.4 Number 9.12 Rates of Change</p>	<ul style="list-style-type: none"> <li>• <b>Base</b></li> <li>• Commutative</li> <li>• Index</li> <li>• <b>Indices</b></li> <li>• Exponent</li> <li>• Negative</li> <li>• Place value</li> <li>• Positive</li> <li>• <b>Power</b></li> <li>• <b>Reciprocal</b></li> <li>• <b>Root</b></li> <li>• SCI/EXP</li> <li>• Scientific notation</li> <li>• Zero</li> </ul>	<p><b>Excelling</b></p> <p>1.2 I can understand and use negative and fractional indices. 1.4 I can investigate positive and negative powers of 10.</p> <p><b>Exceeding</b></p> <p>2.2 I can add, subtract, multiply &amp; divide numbers in standard form with different powers of 10 &amp; without converting. 2.3 I can explain how to adjust a number into standard form.</p> <p><b>Expected</b></p> <p>3.2 I can order numbers in standard form. 3.2 I can add, subtract, multiply &amp; divide numbers in standard form with different powers of 10 &amp; by converting to ordinary form. 3.2 I can use a calculator to work with numbers in standard form. 3.2 I can convert between ordinary and standard form.</p> <p><b>Emerging</b></p> <p>4.3 I can explain why a number is not written in standard form. 4.2 I can order directed numbers. 4.2 I can use basic laws of indices.</p>
	<ol style="list-style-type: none"> <li>10. Understand and use negative indices (H).</li> <li>11. Understand and use fractional indices (H).</li> </ol>	<p><b>New</b></p> <p>Representing values in standard form Converting between ordinary numbers and standard form Altering incorrect standard form to the appropriate format Fractional and negative indices</p>		
		<p><b>Prior</b></p> <p>Calculating indices Place value – Multiplying and dividing numbers by the power of ten Applying laws of indices</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Astronomy</li> <li>• Biology</li> <li>• Financial Maths</li> <li>• Representing large or small numerical values</li> <li>• Interpreting answers on a calculator</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Students often struggle to add and subtract with numbers in standard form as they forget about place values.</li> <li>• Understanding not to count the number of zeros when converting to standard form</li> <li>• Not understanding what the term ordinary number means</li> </ul>	

# Unit 8.12

# Angles in Parallel Lines & Polygons

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<b>6 lessons</b>	<ol style="list-style-type: none"> <li>1. Understand and use basic angle rules and notation (R).</li> <li>2. Investigate angles between parallel lines and the transversal.</li> <li>3. Identify and calculate with alternate and corresponding angles.</li> <li>4. Identify and calculate with co-interior, alternate and corresponding angles.</li> <li>5. Solve complex problems with parallel line angles.</li> <li>6. Construct triangles and special quadrilaterals (R).</li> <li>7. Investigate the properties of special quadrilaterals.</li> <li>8. Identify and calculate with sides and angles in special quadrilaterals.</li> <li>9. Understand and use the properties of diagonals of quadrilaterals (H).</li> <li>10. Understand and use the sum of exterior angles of any polygon.</li> <li>11. Calculate and use the sum of interior angles in any polygon.</li> <li>12. Calculate missing interior angles in regular polygons.</li> <li>13. Prove simple geometric facts (H).</li> <li>14. Construct and angle bisector (H).</li> <li>15. Construct a perpendicular bisector of a line segment (H).</li> </ol>	<p><b>Next</b> 8.14 Symmetry, Reflection and Rotation 9.2 3D shapes 9.3 Construction and congruency 9.8 Angle deduction</p> <hr/> <p><b>New</b> Understanding all of the relationships between angles on a set of parallel lines Calculating the interior and exterior angles of any polygon Constructing angle and perpendicular bisectors</p> <hr/> <p><b>Prior</b> Angles on a straight line and around a point Vertically opposite angles Interior angles of a triangle and quadrilateral Identifying polygons</p>	<ul style="list-style-type: none"> <li>• Adjacent</li> <li>• <b>Alternate</b></li> <li>• Bisect</li> <li>• Bisector</li> <li>• <b>Co-interior</b></li> <li>• <b>Corresponding</b></li> <li>• Demonstrate</li> <li>• Equilateral</li> <li>• Exterior</li> <li>• Interior</li> <li>• Isosceles</li> <li>• Justify</li> <li>• Pair of Compasses</li> <li>• <b>Parallel</b></li> <li>• Perpendicular</li> <li>• Polygon names</li> <li>• Right angled</li> <li>• Scalene</li> <li>• Supplementary</li> <li>• Transversal</li> <li>• Triangle</li> <li>• <b>Vertically opposite</b></li> </ul>	<p><b>Excelling</b> 1.1 I can apply angle reasoning to prove geometric facts.</p> <p><b>Exceeding</b> 2.2 I can construct angle and perpendicular bisectors.</p> <p><b>Expected</b> 3.1 I can use mathematical reasoning to justify angle sizes within parallel lines and special quadrilaterals.</p> <p><b>Emerging</b> 4.1 I can classify angles, recalling angle facts. 4.2 I can draw and measure angles accurately.</p>
<b>Real-life applications and Problem Solving</b>			<b>Misconceptions</b>	
<ul style="list-style-type: none"> <li>• Construction</li> <li>• Graphic design</li> <li>• Interior design</li> </ul>			<ul style="list-style-type: none"> <li>• Correctly identifying vertically opposite angles</li> <li>• Not referring to alternate, corresponding and interior angles as F, Z and C angles</li> <li>• Applying the angle fact that interior and exterior angles equal to 180</li> </ul>	

# Unit 8.13

# Area of Trapezia and Circles

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language		What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	1. Calculate the area of triangles, rectangles and parallelograms (R). 2. Calculate the area of a trapezium. 3. Calculate the perimeter and are of compound shapes 4. Investigate the area of a circle. 5. Calculate the area of a circle and parts of a circle without a calculator. 6. Calculate the area of a circle and parts of a circle with a calculator.	<b>Next</b> 8.15 The data handling cycle 9.2 3D shapes 9.13 Enlargement and similarity	<ul style="list-style-type: none"> <li>• Approximate</li> <li>• Arc</li> <li>• Component</li> <li>• Compound</li> <li>• Circumference</li> <li>• Decimal Place</li> <li>• Diameter</li> <li>• Eliminate</li> <li>• Estimate</li> <li>• Formulae</li> <li>• Infinity</li> <li>• Major Sector</li> <li>• Minor Sector</li> <li>• Pi (<math>\pi</math>)</li> <li>• Significant Figure</li> <li>• Substitute</li> <li>• Trapezium</li> <li>• Parallel</li> <li>• Parallelogram</li> <li>• Perimeter</li> <li>• Perpendicular</li> </ul>	<ul style="list-style-type: none"> <li>• Radius</li> <li>• Radii</li> <li>• Rhombus</li> <li>• Round</li> <li>• Trapezia</li> <li>• Trapezium</li> </ul>	<p><b>Excelling</b> 1.2 I can apply formulae, adapted, to calculate the areas of compound shapes, including using measurement conversions.</p> <p><b>Exceeding</b> 2.3 I can calculate the area of part circles by adapting the formulae.</p> <p><b>Expected</b> 3.2 I can use the formulae to calculate the areas of circles and trapezia.</p> <p><b>Emerging</b> 4.1 I can identify different parts of a circle.</p>
	7. Calculate the perimeter and area of compound shapes which contain sectors	<b>New</b> Identifying key parts of a circle Calculating area of a circle and a trapezia			
		<b>Prior</b> Area of basic shapes Finding the perimeter of all 2d shapes Substituting values into a formula Finding the area of a compound shapes			
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Substituting values into an expression</li> <li>• Graphic Design</li> <li>• Groundskeeper</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Using the diameter for area of a circle</li> <li>• Understanding what answering in terms of pi means</li> </ul>		



# Unit 8.14 Symmetry, Reflection and Rotation

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language		What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Recognise line symmetry.</li> <li>2. Reflect a shape in a horizontal or vertical line 1 (shapes touching the line).</li> <li>3. Reflect a shape in a horizontal or vertical line 2 (shapes not touching the line).</li> <li>4. Reflect a shape in a diagonal line 1 (shapes touching the line).</li> <li>5. Reflect a shape in a diagonal line 2 (shapes not touching the line).</li> <li>6. Reflect a shape from a line given in the format <math>x/y=k</math> or <math>y = +/- x</math></li> <li>7. State the order of rotational symmetry for any 2d shape</li> <li>8. Rotate a shape from a given direction</li> <li>9. Rotate a shape from a given centre of rotation and direction</li> </ol>	<p><b>Next</b></p> <p>8.17 Straight line graphs 9.15 Algebraic representations GCSE topic of transformations</p>	<ul style="list-style-type: none"> <li>• Angle</li> <li>• Anti Clockwise</li> <li>• Cartesian Plane</li> <li>• Centre of Enlargement</li> <li>• Centre of Rotation</li> <li>• Clockwise</li> <li>• Congruent</li> <li>• Construct</li> <li>• Construction Lines</li> <li>• Diagonal</li> <li>• Direction</li> <li>• Equilateral</li> <li>• Horizontal</li> <li>• Image</li> <li>• Isosceles</li> <li>• Object</li> <li>• Perpendicular</li> <li>• Reflect</li> <li>• Regular Polygon</li> <li>• Rotate</li> </ul>	<ul style="list-style-type: none"> <li>• Symmetry line</li> <li>• Translate</li> <li>• Vector</li> <li>• Vertex</li> <li>• Vertical</li> <li>• Vertices</li> </ul>	<p><b>Excelling</b></p> <p>1.1 I can calculate the equation for the line of symmetry.</p> <p><b>Exceeding</b></p> <p>2.4 I can follow multi-step reflectional problems where the line of reflection is given (horizontal, vertical or diagonal).</p> <p><b>Expected</b></p> <p>3.3 I can explain rotational symmetry.</p> <p><b>Emerging</b></p> <p>4.3 I can follow key terms to reflect a shape given the line of symmetry.</p>
		<p><b>New</b></p> <p>Reflecting a shape from a given line in the format <math>x/y=k</math> Identifying and drawing lines in the format <math>x/y = k</math> or <math>y = +/- x</math> Rotating a shape from a given centre of rotation</p>			
		<p><b>Prior</b></p> <p>Reflecting a shape from a mirror line Identifying lines of symmetry Rotating shapes from a given direction Identifying clockwise and anti-clockwise</p>			
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Tessellation</li> <li>• Interior design</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Drawing the lines in the format <math>x/y = k</math> the wrong way around</li> <li>• Clockwise and anti-clockwise</li> <li>• If the angle of rotation is <math>180^\circ</math> it does not need to specify which direction of rotation</li> </ul>		

# Unit 8.15

# The Data Handling Cycle

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language		What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Set up a statistical enquiry.</li> <li>2. Design and criticise questionnaires.</li> <li>3. Draw and interpret pictograms, bar charts and vertical line charts (R).</li> <li>4. Draw and interpret multiple bar charts.</li> <li>5. Draw and interpret pie charts (R).</li> <li>6. Draw and interpret line graphs.</li> <li>7. Choose the most appropriate diagrams for a given set of data.</li> </ol>	<p><b>Next</b></p> <p>8.16 Measures of location 9.7 Money 9.12 Rates of change</p>	<ul style="list-style-type: none"> <li>• Angle</li> <li>• Average</li> <li>• Axes</li> <li>• Axis</li> <li>• Bar Chart</li> <li>• Biased</li> <li>• Bivariate</li> <li>• Classes</li> <li>• Comparison</li> <li>• Composite</li> <li>• Continuous</li> <li>• Degree</li> <li>• Discrete</li> <li>• Distribution</li> <li>• Design</li> <li>• Enquiry</li> <li>• Fraction</li> <li>• Frequency</li> <li>• Grouped Data</li> <li>• Hypothesis</li> <li>• Interpret</li> <li>• Intervals</li> <li>• Investigation</li> <li>• Key</li> <li>• Line Graphs</li> </ul>	<ul style="list-style-type: none"> <li>• Mean</li> <li>• Median</li> <li>• Mode</li> <li>• Multiple</li> <li>• Pictogram</li> <li>• Pie Chart</li> <li>• Population</li> <li>• Proportion</li> <li>• Primary Data</li> <li>• Questionnaire</li> <li>• Qualitative</li> <li>• Quantitative</li> <li>• Random</li> <li>• Range</li> <li>• Representation</li> <li>• Response Box</li> <li>• Sample</li> <li>• Scale</li> <li>• Scatter Graph</li> <li>• Secondary Data</li> <li>• Spread</li> <li>• Tally</li> <li>• Time Series</li> </ul>	<p><b>Excelling</b></p> <p>1.1 I can draw and interpret frequency diagrams, scatter diagrams and stem and leaf diagrams.</p> <p><b>Exceeding</b></p> <p>2.1 I can classify data types (primary, secondary, qualitative, continuous and discrete). 2.3 I can justify the type of representation used for your data.</p> <p><b>Expected</b></p> <p>3.3 I can identify the data that is suitable for putting into bar charts and pictograms.</p> <p><b>Emerging</b></p> <p>4.2 I can draw simple statistical diagrams such as pictograms and bar charts.</p>
	<ol style="list-style-type: none"> <li>8. Represent and interpret grouped quantitative data.</li> <li>9. Find an interpret the range.</li> <li>10. Compare distributions using charts.</li> <li>11. Identify misleading graphs.</li> </ol>	<p><b>New</b></p> <p>Constructing dual and compound bar charts Constructing pie charts Analysing misleading graphs Representing grouped data as a chart</p>			
		<p><b>Prior</b></p> <p>Constructing and interpreting bar charts Interpreting pie charts Interpreting pictograms</p>			
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Advertising and marketing</li> <li>• Data analysis</li> <li>• Financial maths</li> <li>• Producing questionnaires and survey</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Bar charts must have equal gaps</li> <li>• The y-axis should start at zero</li> </ul>		

# Unit 8.16

# Measures of Location

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Understand and use mean, median and mode.</li> <li>2. Choose the most appropriate average.</li> <li>3. Find the mean from an ungrouped frequency table (H).</li> <li>4. Find the mean from a grouped frequency table (H).</li> <li>5. Identify outliers.</li> <li>6. Compare distributions using averages and the range.</li> <li>7. Applying averages to charts and graphs</li> <li>8. Problem solving with averages</li> </ol>	<p><b>Next</b> There are no upcoming units which will require use of averages, teachers must throughout year 9 remind students of mode, median and mean from do now tasks and challenge from the start</p>	<ul style="list-style-type: none"> <li>• Average</li> <li>• Consistent</li> <li>• <b>Estimate</b></li> <li>• Frequency</li> <li>• <b>Mean</b></li> <li>• <b>Median</b></li> <li>• Midpoint</li> <li>• <b>Modal Class</b></li> <li>• Modal Value</li> <li>• Mode</li> <li>• <b>Outlier</b></li> <li>• Range</li> <li>• Represent</li> <li>• Subtotal</li> <li>• Total</li> </ul>	<p><b>Excelling</b> 1.2 I can calculate the estimated mean from grouped data and calculate the mean and median from statistical diagrams.</p> <p><b>Exceeding</b> 2.3 I can identify and justify why outliers do not fit patterns. I can use a measure of spread to compare data and explain if and why I would choose the IQR over the range.</p> <p><b>Expected</b> 3.3 I can justify which average best suits a set of data. I can identify the mode (or modal group) from statistical diagrams.</p> <p><b>Emerging</b> 4.4 I can recall and calculate the mean, median and mode from a list of data.</p>
		<p><b>New</b> Calculating mode and median Calculating averages from grouped and ungrouped frequency tables Problem solving with averages such as reverse mean</p>		
		<p><b>Prior</b> Calculating mean Interpreting grouped and ungrouped frequency tables Analysing line graphs and bar charts</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Data analysis and interpreting statistics</li> <li>• Sport statistics</li> <li>• Financial maths – Interpreting graphs</li> <li>• Weather - Outliners</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• When zero is part of the data to calculate mean, to still include it in the calculations</li> <li>• There can be no mode</li> <li>• There can be more than one mode</li> <li>• Range is not an average</li> </ul>	

# Unit 8.17

# Straight Line Graphs

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>6 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Lines parallel to the axes, <math>y=x</math> and <math>y=-x</math> (R).</li> <li>2. Using tables of values (R).</li> <li>3. Comparing gradients.</li> <li>4. Compare intercepts.</li> <li>5. Understand and use <math>y=mx+c</math>.</li> <li>6. Write an equation in the form <math>y=mx + c</math> (H).</li> <li>7. Find the equation of a line from a graph.</li> <li>8. Interpret gradient and intercepts of real-life graphs.</li> <li>9. Model real-life graphs involving inverse proportion (H).</li> <li>10. Explore perpendicular lines (H).</li> </ol>	<p><b>Next</b></p> <p>9.12 Rates of change 9.15 Algebraic representation GCSE topic of linear graphs</p>	<ul style="list-style-type: none"> <li>• Asymptote</li> <li>• Axes</li> <li>• Axis</li> <li>• Co-ordinate</li> <li>• Coefficient</li> <li>• Cubic</li> <li>• Curve</li> <li>• Direct</li> <li>• Equation</li> <li>• Function</li> <li>• Gradient</li> <li>• Horizontal</li> <li>• Interpret</li> <li>• Inverse</li> <li>• Linear</li> <li>• Negative</li> <li>• Origin</li> <li>• Parabola</li> <li>• Parallel</li> <li>• Perpendicular</li> <li>• Positive</li> <li>• Proportion</li> <li>• Quadratic</li> <li>• Rearrange</li> <li>• Reciprocal</li> </ul>	<p><b>Excelling</b></p> <p>1.3 I can explain the link between parallel and perpendicular lines. 1.4 I can interpret the gradient in direct proportion contexts.</p> <p><b>Exceeding</b></p> <p>2.2 I can calculate the equation of a line in the form <math>y=mx+c</math>. 2.3 I can interpret the y-intercept in real-life contexts.</p> <p><b>Expected</b></p> <p>3.2 I can draw a straight line graph in the form <math>y=mx+c</math>. 3.3 I can compare the gradients and y-intercepts of straight line graphs.</p>
		<p><b>New</b></p> <p>Reading and constructing gradient of a line Identifying y-intercept Constructing lines in the format <math>y=mx+c</math> Find the equation of a graph from a given line Interpreting real-life graphs</p>		<p><b>Emerging</b></p> <p>4.1 I can recognise lines parallel to the axes. 4.1 I can read and plot points in all four quadrants.</p>
		<p><b>Prior</b></p> <p>Identifying and constructed lines in the format <math>y = +/- x</math> and <math>x/y = k</math> Plotting coordinates Identifying parallel lines Substituted values into an expression</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Plumber/builder standing charges</li> <li>• Taxi fares</li> <li>• Mobile phone tariffs</li> </ul>	<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Plotting incorrectly, especially (0, y).</li> <li>• Not using BIDMAS for substitution</li> <li>• Direction of x &amp; y axes (some think top to bottom, not bottom to top).</li> <li>• Multiplying with negatives.</li> </ul>			

# Year 9 – Middle/Higher

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7		Week 8	Week 9	Week 10
Forming and Solving Equations			3D shapes			Testing Conjectures	October Break	Number		Construction and Congruency
Week 11	Week 12	Week 13	Week 14			Week 15	Week 16	Week 17	Week 18	Week 19
Construction and Congruency	Assessment Week	Using Percentages		Christmas Break	Christmas Break	Money		Angle Deduction		Rotation and Translation
Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26	Week 27			Week 28
Rotation and Translation	February Break	Pythagoras' Theorem & Trig.			Assessment Week	Ratio and Proportion		Easter Break	Easter Break	Rates of Change
Week 29	Week 30	Week 31	Week 32	Week 33		Week 34	Week 35	Week 36	Week 37	Week 38
Rates of Change	Enlargement and Similarity		Probability		May Break	Algebraic Representation		Assessment Week	Algebraic Representation	

# Year 9 – Lower

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7		Week 8	Week 9	Week 10
Forming and Solving Equations			3D shapes			Number	October Break	Number		Construction and Congruency
Week 11	Week 12	Week 13	Week 14			Week 15	Week 16	Week 17	Week 18	Week 19
Construction and Congruency	Assessment Week	Using Percentages		Christmas Break	Christmas Break	Money		Angle Deduction		Rotation and Translation
Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26	Week 27			Week 28
Rotation and Translation	February Break	Pythagoras' Theorem & Trig.			Assessment Week	Ratio and Proportion		Easter Break	Easter Break	Rates of Change
Week 29	Week 30	Week 31	Week 32	Week 33		Week 34	Week 35	Week 36	Week 37	Week 38
Rates of Change	Enlargement and Similarity		Probability		May Break	Algebraic Representation		Assessment Week	Algebraic Representation	

Y9 higher

# Unit 9.1

# Forming and Solving Equations

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language		What I will be learning:
<p style="text-align: center;"><b>6 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Solve one- and two-step equations and inequalities (R).</li> <li>2. Solve one- and two-step equations and inequalities with brackets (R).</li> <li>3. Inequalities with negative coefficients of x.</li> <li>4. Solve equations with unknowns on both sides.</li> <li>5. Solve inequalities with unknowns on both sides.</li> <li>6. Solving equations and inequalities in context.</li> <li>7. Substituting into formulae and equations.</li> <li>8. Rearrange formulae (one-step).</li> <li>9. Rearrange formulae (two-step).</li> <li>10. Rearrange complex formulae including brackets and squared (H).</li> </ol>	<p><b>Next</b></p> <p>9.2 3D shapes 9.5 Testing conjectures 9.10 Pythagoras &amp; Trigonometry 9.11 Ratio and proportion</p>	<ul style="list-style-type: none"> <li>• Balance</li> <li>• Coefficient</li> <li>• Constant</li> <li>• Cubic</li> <li>• Curve</li> <li>• Equation</li> <li>• Expand</li> <li>• Expression</li> <li>• Formula</li> <li>• Formulae</li> <li>• Function</li> <li>• Gradient</li> <li>• Greater than</li> <li>• Identity</li> <li>• Inequality</li> <li>• Inverse</li> <li>• Less than</li> <li>• Linear</li> <li>• Negative</li> <li>• Positive</li> </ul>	<ul style="list-style-type: none"> <li>• Quadratic</li> <li>• Rearrange</li> <li>• Satisfy</li> <li>• Solution</li> <li>• Solve</li> <li>• Subject</li> <li>• Substitute</li> <li>• Term</li> <li>• Unknown</li> <li>• Variable</li> <li>• y-intercept</li> <li>• <math>y=mx+c</math></li> </ul>	<p><b>Excelling</b></p> <p>1.2 I can rearrange complex formulae. 1.4 I can form and solve multi-step equations with negative and fractional solutions in context.</p> <p><b>Exceeding</b></p> <p>2.4 I can form and solve equations and inequalities in context. 2.2 I can rearrange formulae with more than 1 step.</p> <p><b>Expected</b></p> <p>3.2 I can solve equations and inequalities with unknowns on both sides. 3.2 I can solve equations and inequalities with negative coefficients of x. 3.2 I can rearrange 1 step formulae.</p> <p><b>Emerging</b></p> <p>4.2 I can solve 1 &amp; 2 step equations with brackets. 4.2 I can solve 1 &amp; 2 step equations and inequalities.</p>
	<p><b>New</b></p> <p>Forming and solving equations Solving inequalities with unknowns on both sides of the inequality Rearrange formulae (Changing the subject)</p>				
	<p><b>Prior</b></p> <p>Expanding brackets Solving two step equations Solving equations with brackets Solving inequalities Solving equations with unknowns on both sides</p>				
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Computer programmer, research scientist, electrical engineer, architect, mechanical engineer, resource manager, builder, health care professional, food and agriculture, transportation optimisation, manufacturing. energy companies</li> <li>• <a href="https://sciencing.com/careers-use-linear-equations-6060294.html">https://sciencing.com/careers-use-linear-equations-6060294.html</a></li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Rules for calculating with negatives</li> <li>• Adding instead of multiplying when expanding</li> <li>• Use of BIDMAS particularly indices</li> <li>• That answers must be integers</li> <li>• That solutions must be integers/decimals.</li> </ul>		



# Unit 9.2

# Three Dimensional Shapes

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>6 lessons</b></p>	<ol style="list-style-type: none"> <li>Know names of 2-D and 3-D shapes.</li> <li>Recognise prisms.</li> <li>Accurate nets of cuboids and other 3-D shapes.</li> <li>Sketch and recognise nets of cuboids and other 3-D shapes.</li> <li>Plans and elevations.</li> <li>Find area of 2D shapes (R).</li> <li>Surface area of cubes and cuboids.</li> <li>Surface area of triangular prisms.</li> <li>Surface area of a cylinder.</li> <li>Volumes of cubes and cuboids.</li> <li>Volume of other 3-D shapes – prisms and cylinders.</li> <li>Explore volumes of cones, pyramids and spheres (H).</li> </ol>	<p><b>Next</b></p> <p>9.3 Construction and congruency 9.5 Testing conjectures 9.8 Angle deduction</p>	<ul style="list-style-type: none"> <li>Area</li> <li>Base</li> <li>Composite</li> <li>Cone</li> <li>Convert</li> <li>Cross-section</li> <li>Cube</li> <li>Cuboid</li> <li>Cylinder</li> <li>Depth</li> <li>Dimension</li> <li>Edge</li> <li>Elevation</li> <li>Equilateral</li> <li>Face</li> <li>Frustrum</li> <li>Height</li> <li>Isosceles</li> <li>Kite</li> <li>Length</li> <li>Net</li> <li>Parallelogram</li> <li>Plan</li> <li>Prism</li> <li>Quadrilateral</li> </ul>	<p><b>Rectangle</b></p> <ul style="list-style-type: none"> <li>Rhombus</li> <li>Scalene</li> <li>Sphere</li> <li>Square</li> <li>Surface area</li> <li>Trapezium</li> <li>Triangle</li> <li>Triangular prism</li> <li>Units</li> <li>Vertex</li> <li>Vertices</li> <li>Volume</li> <li>Width</li> </ul>
		<p><b>New</b></p> <p>Labelling prisms and parts of 3d shapes Constructing plans and elevations Sketch nets and 3d shapes from a net Calculating surface area Finding volume of 3d shapes Substitution values into a formula to find a volume</p>		<p><b>Excelling</b></p> <p>1.4 I can solve surface area &amp; volume problems in context. 1.3 I can explain how to construct nets. 1.3 I can justify methods used to calculate with volume &amp; surface area. 1.2 I can calculate the surface area &amp; volume of cones, pyramids, spheres &amp; frustrums. 1.4 I can describe the impact of moving parts of a shape on plans &amp; elevations.</p> <p><b>Exceeding</b></p> <p>2.1 I can recognise and draw the nets of common prisms &amp; pyramids. 2.2 I can calculate the surface area &amp; volume of common 3D shapes. 2.2 I can draw plans and elevations of complex 3D shapes and draw shapes, given their plan &amp; elevations.</p> <p><b>Expected</b></p> <p>3.1 I can recognise and draw the nets of common 3D shapes. 3.2 I can calculate the surface area &amp; volume of cubes &amp; cuboids. 3.2 I can calculate the area of a circle. 3.2 I can draw plans and elevations of basic 3D shapes.</p> <p><b>Emerging</b></p> <p>4.1 I can recognise common 2D &amp; 3D shapes 4.2 I can use a ruler accurately &amp; use formal letter terminology. 4.1 I can recognise parallel and perpendicular faces of 3D shapes. 4.2 I can calculate the area of common quadrilaterals and triangles.</p>
		<p><b>Prior</b></p> <p>Area of basic shapes Finding the perimeter of all 2d shapes Substituting values into a formula Finding the area of a compound shape Identifying key parts of a circle Calculating area of a circle and a trapezia</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>Paint needed for problem solving</li> <li>Liquid filling capacity</li> <li>Mechanic needs to know the volume of a cylinder on a motor bike</li> <li>Water board needing to know capacity of pipes</li> <li>Architecture</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>Area &amp; volume conversions are linear</li> <li>Incorrect units used</li> <li>Converting all dimensions to the same units of measure</li> <li>Orientation of plans &amp; elevations</li> </ul>	

# Unit 9.3

# Testing Conjectures

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<b>2 lessons</b>	<ol style="list-style-type: none"> <li>1. Listing factors, multiples and primes (R).</li> <li>2. Answering conjectures in the format of 'True or False?'</li> <li>3. Answering conjectures in the format of 'Always, sometimes never.'</li> <li>4. Answering conjectures in the format of 'show that.'</li> <li>5. Conjectures about number such as multiples, evens, odds, square, differences between squares etc.</li> <li>6. Expand a pair of binomials</li> <li>7. Conjectures with algebra such as representing even and odd numbers algebraically</li> <li>8. Expand three binomials.</li> </ol>	<p><b>Next</b> GCSE exam technique for higher ability students, proof using algebraic expressions is a common 2/3 mark question</p> <hr/> <p><b>New</b> Understanding examples and counter-examples Understanding what a conjecture is Using algebraic expressions as proof</p> <hr/> <p><b>Prior</b> Identifying factors, multiples and prime numbers Discussing answers in the format of True or False, Always, Sometimes, Never etc.</p>	<ul style="list-style-type: none"> <li>• Conjecture</li> <li>• <b>Number Grid</b></li> <li>• <b>Factor</b></li> <li>• <b>Multiple</b></li> <li>• <b>Prime</b></li> <li>• <b>Square</b></li> <li>• Expand</li> <li>• Expression</li> <li>• Equation</li> <li>• Multiply</li> <li>• Product</li> <li>• Sum</li> <li>• Example</li> <li>• Counter-example</li> <li>• Proof</li> <li>• Algebraic representation</li> </ul>	<p><b>Excelling</b> 1. 4 I can use numerical and algebraic equivalence to explore conjectures, explain if they are correct or not and solve problems.</p> <p><b>Exceeding</b> 2.3 I can use numerical equivalence to explore conjectures and explain if they are correct or not.</p> <p><b>Expected</b> 3.2 I can use proof by counterexample to show that a conjecture is not true.</p> <p><b>Emerging</b> 4.1 I can recognise prime numbers, multiples and factors of numbers.</p>
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Presenting mathematical ideas and providing proof to approve or disapprove an idea</li> <li>• Reasoning skills</li> <li>• Presentation skills</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Understanding that proof is not a few numerical examples but must be algebraic</li> </ul>	

# Unit 9.4

# Number Sense

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p><b>4 lessons (Higher)</b></p> <p><b>6 lessons (Middle/Lower)</b></p>	<ol style="list-style-type: none"> <li>Identifying and understand the difference between integers, real and rational numbers.</li> <li>Understand and use surds such as collecting like terms, operations with surds and basic rationalising of the denominator (H).</li> <li>Operations with directed numbers (R).</li> <li>Solve problems with integers such as operations and worded questions</li> <li>Solve problems with decimals.</li> <li>Finding HCF and LCM of two or more integers(R).</li> <li>Adding and subtracting fractions (R).</li> <li>Multiplying and dividing fractions (R).</li> <li>Solving problems with fractions including recap on operations with fractions</li> <li>Writing numbers in standard form (R).</li> </ol>	<p><b>Next</b></p> <p>9.5 Testing conjectures 9.6 Using percentages 9.7 Money 9.11 Ratio and Proportion 9.14 Probability 9.15 Algebraic representation</p> <p><b>New</b></p> <p>Identifying rational numbers Representing surds Operations with surds Rationalise denominators</p> <p><b>Prior</b></p> <p>LCM &amp; HCF Writing ordinary numbers in standard form Operations with fractions and decimals Operations with directed numbers Worded questions which require using the four operations</p>	<ul style="list-style-type: none"> <li>Base</li> <li>Denominator</li> <li><b>Equivalent</b></li> <li>Factor</li> <li>HCF</li> <li>Improper</li> <li>Index</li> <li>Indices</li> <li>Integer</li> <li><b>Irrational</b></li> <li><b>LCM</b></li> <li>Mixed number</li> <li>Multiple</li> <li>Numerator</li> <li>Order</li> <li>Ordinary form</li> <li>Power</li> <li>Proper</li> <li>Rational</li> <li>Real</li> <li><b>Standard form</b></li> <li><b>Terminating</b></li> </ul>	<p><b>Excelling</b></p> <p>1.2 I can work fluently both numerically and algebraically. i.e. BIDMAS and multi step calculations involving decimals, fractions and surds; and form and use algebraic equations and formula to solve mathematical problems correctly</p> <p><b>Exceeding</b></p> <p>2.4 I can plan and solve more complex problems involving HCF, LCM, fractions, decimals and time.</p> <p><b>Expected</b></p> <p>3.4 I can plan and solve simple problems using HCF and LCM.</p> <p><b>Emerging</b></p> <p>4.4 I can identify the skills needed to solve a problem and check if results are sensible.</p>
<p><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>Astronomy</li> <li>Biology</li> <li>Financial Maths</li> <li>Representing large or small numerical values</li> <li>Interpreting answers on a calculator</li> </ul>			<p><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>Students often mix <math>\frac{1}{3}</math> up with 30% or 33%.</li> <li>Thinking they must have a common denominator to multiply or divide a fraction.</li> <li>Not converting mixed fractions to improper fractions before multiplying or dividing</li> <li>Negative and Minus – understanding the difference between these key words. Understanding that one is a operation.</li> <li>Thinking that positive numbers have only one square root</li> </ul>	

# Unit 9.5

# Constructions and Congruency

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Draw and measure angles (R).</li> <li>2. Construct and interpret scale drawings (R).</li> <li>3. Locus of distance from a point.</li> <li>4. Locus of distance from a straight line/shape.</li> <li>5. Locus equidistant from two points.</li> <li>6. Construct a perpendicular bisector.</li> <li>7. Construct a perpendicular from a point.</li> <li>8. Construct a perpendicular to a point.</li> <li>9. Locus of distance from two lines.</li> <li>10. Construct an angle bisector.</li> <li>11. Construct triangles from given information (R).</li> <li>12. Identify congruent figures.</li> <li>13. Explore congruent triangles including answering exam questions on proving congruency</li> </ol>	<p><b>Next</b></p> <p>9.5 Testing Conjectures 9.10 Pythagoras and Trigonometry 9.13 Enlargement and Similarity</p>	<ul style="list-style-type: none"> <li>• Angle</li><li>• Area</li><li>• Base</li><li>• Bisect</li><li>• Bisector</li><li>• Circumference</li><li>• Composite</li><li>• Cone</li><li>• Congruency</li><li>• Convert</li><li>• Cross-section</li><li>• Cube</li><li>• Cuboid</li><li>• Cylinder</li><li>• Depth</li><li>• Dimension</li><li>• Edge</li><li>• Equidistant</li><li>• Equilateral</li><li>• Face</li><li>• Height</li><li>• Isosceles</li><li>• Kite</li><li>• Length</li><li>• Locus</li><li>• Loci</li> </ul> <ul style="list-style-type: none"> <li>• Net</li><li>• Parallel</li><li>• Parallelogram</li><li>• Perpendicular</li><li>• Prism</li><li>• Quadrilateral</li><li>• Rectangle</li><li>• Rhombus</li><li>• Scalene</li><li>• Sketch</li><li>• Square</li><li>• Surface area</li><li>• Trapezium</li><li>• Triangle</li><li>• Triangular prism</li><li>• Units</li><li>• Vertex</li><li>• Vertices</li><li>• Volume</li><li>• Width</li> </ul>	<p><b>Excelling</b></p> <p>1.2 I can create congruent shapes. 1.3 I can describe fluently how to draw a locus of point(s), line(s) and shapes.</p> <p><b>Exceeding</b></p> <p>2.2 I can draw a perpendicular line from and to a point. 2.2 I can draw the locus of a distance from a shape, 2 points and 2 lines. 2.3 I can explain whether or not 2 shapes are congruent. 2.3 I can explain basic loci.</p> <p><b>Expected</b></p> <p>3.2 I can bisect an angle and draw a perpendicular bisector of a line. 3.2 I can draw the locus of a distance from a point and a straight line. 3.2 I can construct SSS, SAS, ASA triangles and recognise their congruence. 3.1 I can recognise congruent shapes.</p> <p><b>Emerging</b></p> <p>4.2 I can use a ruler &amp; protractor to draw accurately 4.3 I can draw and interpret scale drawings.</p>
		<p><b>New</b></p> <p>Understanding congruency The correct technique to answer congruency Constructing Loci</p>		
		<p><b>Prior</b></p> <p>Interior angles of a triangle and quadrilateral Identifying polygons Calculating the interior and exterior angles of any polygon Constructing angle and perpendicular bisectors</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Product/package design</li> <li>• Architecture</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Missing faces from nets/surface area calculations</li> <li>• Where a compass is held, which leads to errors</li> <li>• Leaving construction lines on all mathematical drawings</li> </ul>	

# Unit 9.6

# Using Percentages

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Use the equivalence of fractions, decimals and percentages (R).</li> <li>2. Calculate percentage increases and decreases (R).</li> <li>3. Express a change as a percentage (R).</li> <li>4. Solve “reverse” percentage problems.</li> <li>5. Recognise and solve percentage problems (non-calculator).</li> <li>6. Recognise and solve percentage problems (calculator) (R).</li> <li>7. Solve problems with repeated percentage change (H).</li> </ol>	<p><b>Next</b> 9.7 Money 9.12 Rates of change GCSE topics: Number, Growth &amp; Decay, Financial maths</p>	<ul style="list-style-type: none"> <li>• Appreciation</li> <li>• <b>Compound</b></li> <li>• Decimal</li> <li>• Decrease</li> <li>• Denominator</li> <li>• <b>Depreciation</b></li> <li>• Equivalent</li> <li>• Fraction</li> <li>• Gross</li> <li>• Increase</li> <li>• <b>Interest</b></li> <li>• <b>Inverse</b></li> <li>• <b>Multiplier</b></li> <li>• NET</li> <li>• Numerator</li> <li>• Percentage</li> <li>• <b>Simple</b></li> </ul>	<p><b>Excelling</b> 1.2 I can recognise where calculate compound interest and depreciation are used and apply the formulae.</p> <p><b>Exceeding</b> 2.2 I can calculate with reverse percentage multipliers.</p> <p><b>Expected</b> 3.2 I can use decimal multipliers to calculate percentages.</p> <p><b>Emerging</b> 4.4 I can check if results are sensible using fractions. i.e. 54% is the answer slightly more than half.</p>
		<p><b>New</b> Solving problems with repeated percentage change Reverse percentages</p>		
		<p><b>Prior</b> Applying a decimal multiplier on a calculator Calculating percentage change Identifying a range of methods to calculate percentage and find the most efficient</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Mortgages, borrowing &amp; lending money</li> <li>• Sales, removing VAT</li> <li>• Builder/plumber/electrician bills (cost, cost + VAT, labour)</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• When increasing by 110% to multiply by 1.1</li> <li>• 0.3 = 3%</li> </ul>	

# Unit 9.7

# Maths and Money

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Solve problems with bills and bank statements.</li> <li>2. Calculate simple interest.</li> <li>3. Calculate compound interest.</li> <li>4. Solve problems with Value Added Tax.</li> <li>5. Calculate wages and taxes.</li> <li>6. Solve problems with exchange rates.</li> <li>7. Solve unit pricing problems.</li> <li>8. Converting between currencies</li> </ol>	<p><b>Next</b> GCSE topics: Number, Multiplicative reasoning, statistical analysis</p>	<ul style="list-style-type: none"> <li>• Financial</li> <li>• VAT</li> <li>• <b>Gross</b></li> <li>• <b>Net</b></li> <li>• Interest</li> <li>• <b>Depreciation</b></li> <li>• <b>Unit Pricing</b></li> <li>• <b>Profit</b></li> <li>• Exchange Rate</li> </ul>	<p><b>Excelling</b> 1.1 I can remember a wide range of facts across year 7, 8 and 9 topics and apply them</p> <p><b>Exceeding</b> 2.2 I can work fluently numerically. i.e. BIDMAS and multi step calculations involving decimals and money and be able to manipulate algebra to solve monetary problems.</p> <p><b>Expected</b> 3.3 I can describe and use mathematical terminology and calculations to support my work.</p> <p><b>Emerging</b> 4.4 I can identify the skills needed to solve a problem and check that results are sensible.</p>
		<p><b>New</b> Understanding interest Calculating simple and compound interest</p>		
		<p><b>Prior</b> Interpreting bank statements Calculating percentages with and without a calculator</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Financial maths</li> <li>• Calculating VAT, income and interest</li> <li>• Applying interest and understanding it's purpose</li> <li>• Identifying the best value deals which include percentage increase/decrease</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Understanding key words such as debit and credit</li> <li>• Not answering to 2 decimal places</li> </ul>	

# Unit 9.8

# Angle Deduction

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Angles in parallel lines (R).</li> <li>2. Solving angle problems (using chains of reasoning).</li> <li>3. Angle problems with algebra.</li> <li>4. Conjectures with angles.</li> <li>5. Conjectures with shapes including interior and exterior angles</li> <li>6. Links constructions and geometrical reasoning (H).</li> </ol>	<p><b>Next</b></p> <p>9.10 Pythagoras &amp; Trigonometry 9.13 Enlargement and Similarity</p>	<ul style="list-style-type: none"> <li>• Alternate</li> <li>• Angles</li> <li>• Chord</li> <li>• Co-interior</li> <li>• Corresponding</li> <li>• Diameter</li> <li>• Exterior</li> <li>• Interior</li> <li>• Isosceles</li> <li>• Notation</li> <li>• Parallel</li> <li>• Perpendicular</li> <li>• Point</li> <li>• Radius</li> <li>• Sum</li> <li>• Supplementary</li> <li>• Straight line</li> <li>• Tangent</li> </ul>	<p><b>Excelling</b></p> <p>1.1 I can recall a wide range of facts across year 7, 8 and 9 angles and geometric reasoning and apply them to multi-step problems.</p> <p><b>Exceeding</b></p> <p>2.3 I can justify using mathematical terminology and calculations to support multi-step problems.</p> <p><b>Expected</b></p> <p>3.3 I can describe using mathematical terminology and calculations to support simple problems in parallel lines.</p> <p><b>Emerging</b></p> <p>4.4 I can check if results are sensible (ie angle size being acute, obtuse etc).</p>
		<p><b>New</b></p> <p>Exam technique with providing reasoning for angles Applying conjectures to shape and angle</p>		
		<p><b>Prior</b></p> <p>Interior and exterior angles for polygons Relationships on angles on parallel lines Angles on a straight line and around a point Vertically opposite angles</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Architecture.</li> <li>• Building and design.</li> <li>• Model making.</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Correctly identifying vertically opposite angles</li> <li>• Not referring to alternate, corresponding and interior angles as F, Z and C angles</li> <li>• Applying the angle fact that interior and exterior angles equal to 180</li> </ul>	

# Unit 9.9

# Rotation and Translation

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Identify the order of rotational symmetry of a shape.</li> <li>2. Compare and contrast rotational symmetry with line symmetry.</li> <li>3. Rotate a shape about a point on a shape.</li> <li>4. Rotate a shape about a point not on a shape.</li> <li>5. Translate points and shapes by a given vector.</li> <li>6. Describe transformations which contain rotation and translation</li> <li>7. Compare rotation and reflection of shapes.</li> <li>8. Find the result of a series of transformations (H).</li> <li>9. Introduction to operations with vectors (H)</li> </ol>	<p><b>Next</b> GCSE topic – Transformations GCSE topic – Vectors</p>	<ul style="list-style-type: none"> <li>• Rotate</li> <li>• Translate</li> <li>• Column vector</li> <li>• Angle</li> <li>• Direction</li> <li>• Transformation</li> <li>• Clockwise</li> <li>• Anti-clockwise</li> <li>• Centre of rotation</li> <li>• Symmetry</li> <li>• Order of rotation</li> </ul>	<p><b>Excelling</b> 1.3 I can recall and use the correct mathematical terminology to describe multi-step transformations.</p> <p><b>Exceeding</b> 2.3 I can recall and use the correct mathematical terminology to describe rotations and reflections.</p> <p><b>Expected</b> 3.4 I can break down the skills needed to rotate a shape about a given point.</p> <p><b>Emerging</b> 4.4 I can identify the skills used in rotational and reflectional symmetry.</p>
		<p><b>New</b> Describing transformations with the correct GCSE exam technique</p>		
		<p><b>Prior</b> Reflecting a shape from a mirror line Identifying lines of symmetry Rotating shapes from a given direction Identifying clockwise and anti-clockwise</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Graphic design</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Clockwise and anti-clockwise</li> <li>• If the angle of rotation is 180° it does not need to specify which direction of rotation</li> <li>• Interpreting the column vector incorrectly for translation</li> </ul>	



# Unit 9.10

# Pythagoras' Theorem and Trigonometry

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<b>6 lessons</b>	<ol style="list-style-type: none"> <li>1. Squares and square roots (R).</li> <li>2. Identify the hypotenuse of a right-angled triangle.</li> <li>3. Determine whether a triangle is right-angled.</li> <li>4. Calculate the hypotenuse of a right-angles triangle.</li> <li>5. Calculate missing sides in a right-angled triangle.</li> <li>6. Use Pythagoras' theorem on coordinate axes.</li> <li>7. Explore proofs of Pythagoras' theorem.</li> <li>8. Use Pythagoras' theorem in 3-D shapes (H).</li> <li>9. Applying trigonometry to find the missing length of a right angled triangle</li> <li>10. Applying trigonometry to find the missing angle of a right angled triangle</li> <li>11. Forming and solving a trigonometry question</li> </ol>	<p><b>Next</b> GCSE topic – Trigonometry GCSE topic – Bounds and More Trigonometry</p> <hr/> <p><b>New</b> Applying Pythagoras theorem Applying trigonometry to find the missing length or angle of a right angled triangle</p> <hr/> <p><b>Prior</b> Calculating indices and roots Constructing SAS triangles</p>	<ul style="list-style-type: none"> <li>• Hypotenuse</li> <li>• Theorem</li> <li>• Formula</li> <li>• Substitute</li> <li>• Square</li> <li>• Square root</li> <li>• Manipulate</li> <li>• Perpendicular</li> <li>• Adjacent</li> <li>• Opposite</li> </ul>	<p><b>Excelling</b> 1.4 I can solve complex problems involving Pythagoras, including in 3 dimensions.</p> <p><b>Exceeding</b> 2.3 I can use Pythagoras's Theorem to justify whether a triangle is a right angle.</p> <p><b>Expected</b> 3.2 I can calculate the missing side of a right angle triangle using Pythagoras' Theorem.</p> <p><b>Emerging</b> 4.2 I can calculate square and square root numbers. 4.4 I can identify the hypotenuse of a right angled triangle.</p>
<b>Real-life applications and Problem Solving</b> <ul style="list-style-type: none"> <li>• Construction</li> <li>• Location services</li> <li>• Astronomy</li> </ul>			<b>Misconceptions</b> <ul style="list-style-type: none"> <li>• Correctly identifying the hypotenuse</li> <li>• Using the wrong rule for trigonometry</li> <li>• Using the inverse function to find a missing angle</li> </ul>	

# Unit 9.11

# Solving Ratio & Proportional

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Solve problems with direct proportion (R).</li> <li>2. Direct proportion and conversion graphs (R).</li> <li>3. Solve problems with inverse proportion.</li> <li>4. Graphs of inverse relationships (H).</li> <li>5. Solve ratio problems given the whole or a part (R).</li> <li>6. Solve “best buy” problems.</li> <li>7. Solve problems with ratio and algebra (H).</li> </ol>	<p><b>Next</b></p> <p>9.12 Rates of Change 9.13 Enlargement and Similarity 9.15 Algebraic Representation</p>	<ul style="list-style-type: none"> <li>• Proportion</li> <li>• Indirect</li> <li>• Inverse</li> <li>• Multiplier</li> <li>• Expression</li> <li>• Equation</li> <li>• <b>Direct</b></li> <li>• <b>Inverse</b></li> <li>• Ratio</li> <li>• <b>Unit price</b></li> <li>• <b>Relationship</b></li> <li>• <b>Conversion graphs</b></li> </ul>	<p><b>Excelling</b></p> <p>1.2 I can use algebra and/or bar models to solve inverse proportion problems.</p> <p><b>Exceeding</b></p> <p>2.2 I can use algebra and/or bar models to solve direct proportion problems.</p> <p><b>Expected</b></p> <p>3.3 I can draw and use direct proportion graphs, including conversion graphs.</p> <p><b>Emerging</b></p> <p>4.3 I can explain, in mathematical terms, the relationship between two variables in direct proportion.</p>
		<p><b>New</b></p> <p>Indirect proportion – solving numerical, algebraically and graphical problems Best buy problems Problems including ratio and algebra</p>		
		<p><b>Prior</b></p> <p>Solving multiplicative reasoning problems Writing ratios in the format n:1 Comparing ratios to fractions Represent gradient as a ratio</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Currency conversion</li> <li>• Conversion of distances for speeds</li> <li>• Best buy – Identifying the best value for money products</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Using ratios to answer probability questions – this is not suitable.</li> <li>• Fractions and decimals cannot be used in ratios – they can when using the form 1:n.</li> </ul>	

# Unit 9.12

# Rates of Change

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<b>4 lessons</b>	<ol style="list-style-type: none"> <li>1. Solve speed, distance and time problems without a calculator.</li> <li>2. Solve speed, distance and time problems with a calculator.</li> <li>3. Construct and interpret distance/time graphs.</li> <li>4. Solve problems with density, mass and volume.</li> <li>5. Solve flow (volume) problems and their graphs (capacity/volume).</li> <li>6. Rates of change including financial problems, real-life graphs and time problems</li> <li>7. Convert compound units including time, distance, mass, area and volume</li> </ol>	<p><b>Next</b> GCSE topic – Area and volume including metric conversions Data analysis such as converting between speed, time and distance</p> <hr/> <p><b>New</b> Time/Distance graphs Converting between all compound units Calculating speed, distance and time Calculating density, mass and volume</p> <hr/> <p><b>Prior</b> Calculations from a formula triangle Metric conversions Ratio problems Financial problems Conversion graphs</p>	<ul style="list-style-type: none"> <li>• Speed</li> <li>• Distance</li> <li>• Time</li> <li>• Minutes</li> <li>• Hours</li> <li>• Convert</li> <li>• Conversion</li> <li>• Kilometres</li> <li>• Miles</li> <li>• Metres</li> <li>• Grams</li> <li>• Mass</li> <li>• Formula</li> <li>• Volume</li> <li>• Millilitre</li> <li>• Rate of change</li> <li>• Density</li> <li>• Acceleration</li> </ul>	<p><b>Excelling</b> 1.1 I can convert between units within compound units.</p> <p><b>Exceeding</b> 2.3 I can justify using mathematical terminology and calculations to support my reasoning for calculation to solve problems.</p> <p><b>Expected</b> 3.1 I can form the formulae triangles for compound measures using given units.</p> <p><b>Emerging</b> 4.4 I understand that the gradient of a SDT graph indicates the speed.</p>
<b>Real-life applications and Problem Solving</b>			<b>Misconceptions</b>	
<ul style="list-style-type: none"> <li>• Construction – Metric conversions</li> <li>• Converting between speed, time and distance</li> <li>• Financial maths</li> </ul>			<ul style="list-style-type: none"> <li>• Using formulae triangles correctly</li> <li>• All metric conversions do not use 100</li> </ul>	

# Unit 9.13

# Enlargement and Similarity

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>6 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Recognise enlargement and similarity.</li> <li>2. Enlarge a shape by a given positive integer scale factor.</li> <li>3. Enlarge a shape by a positive integer scale factor from a point.</li> <li>4. Enlarge a shape by a positive fractional scale factor.</li> <li>5. Enlarge a shape by a negative scale factor (H).</li> <li>6. Work out missing sides and angles in a pair of given similar shapes.</li> <li>7. Solve problems with similar triangles</li> <li>8. Explore ratios in right-angled triangles (H).</li> <li>9. Solve problems with similar shapes which include area, surface area and volume</li> <li>10. Proofs of congruency and similarity (H)</li> </ol>	<p><b>Next</b></p> <p>GCSE Topic – Ratio and Proportion GCSE Topic – Transformations</p>	<ul style="list-style-type: none"> <li>• Enlargement</li> <li>• Similar shapes</li> <li>• Equi-angular</li> <li>• Scale factor</li> <li>• Negative</li> <li>• Fractional</li> <li>• Integer</li> <li>• Centre of enlargement</li> <li>• Ratio</li> </ul>	<p><b>Excelling</b></p> <p>1.3 I can construct justifications as to how/why shapes are similar using the correct mathematical terminology with both negative and fractional scale factors.</p> <p><b>Exceeding</b></p> <p>2.3 I can explain how a shape has been enlarged about a centre of enlargement.</p> <p><b>Expected</b></p> <p>3.2 I can explain if a shape has been enlarged by a positive scale factor.</p> <p><b>Emerging</b></p> <p>4.2 I can enlarge a shape by a positive integer scale factor.</p>
		<p><b>New</b></p> <p>Enlarging from a centre of enlargement Enlarging by a fractional and negative scale factor Solving problems with similar shapes</p>		
		<p><b>Prior</b></p> <p>Enlarging from a given ratio Using a ratio to find a missing value Plotting coordinates Multiplying by decimals and fractions</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Problem solving using ratio</li> <li>• Enlarging from a ratio which is the skill used for conversions including currency</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Similar shapes problems which contain finding missing angles</li> <li>• Finding the area and volume scale factor for similar shapes</li> <li>• The correct method to find surface area</li> </ul>	

# Unit 9.14 Probability

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Single event probability (R).</li> <li>2. Relative frequency – include convergence.</li> <li>3. Listing expected outcomes.</li> <li>4. Calculating the probability of independent events.</li> <li>5. Use tree diagrams to calculate two or more event probability (H).</li> <li>6. Use tree diagrams to solve “without replacement” problems (H).</li> <li>7. Use diagrams to work out probability.</li> </ol>	<p><b>Next</b> GCSE topic - Probability</p>	<ul style="list-style-type: none"> <li>• Affect</li> <li>• Biased</li> <li>• Equally likely</li> <li>• Event</li> <li>• Expected</li> <li>• Experiment</li> <li>• Fair</li> <li>• Frequency</li> <li>• Independent</li> <li>• Intersection</li> <li>• Outcome</li> <li>• Probability</li> <li>• Product</li> <li>• Relative frequency</li> <li>• Replacement</li> <li>• Sample Space</li> <li>• Trial</li> <li>• Two-way table</li> <li>• Union</li> <li>• Venn Diagram</li> </ul>	<p><b>Excelling</b> 1.2 I can calculate the probability of multiple events happening using probability trees.</p> <p><b>Exceeding</b> 2.2 I can calculate the probability of a single event happening using fractions, decimals and percentages, from different visual representations.</p> <p><b>Expected</b> 3.2 I understand that probability must be between 0 &amp; 1 or equivalent.</p> <p><b>Emerging</b> 4.3 I can explain worded probability lines.</p>
		<p><b>New</b> Relative frequency Constructing tree diagrams to calculate probability</p>		
		<p><b>Prior</b> Representing single event probability Adding and multiplying fractions</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Interpreting and understanding probability</li> <li>• Stock Market</li> <li>• Weather</li> <li>• Sport Statistics</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Adding fractions for calculate probability</li> <li>• Answering probability as a worded description</li> </ul>	

# Unit 9.15 Algebraic Representation

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Interpret and construct linear graphs in the format <math>y=mx+c</math> (R)</li> <li>2. Draw and interpret quadratic graphs.</li> <li>3. Interpret graphs, including reciprocal and piece-wise.</li> <li>4. Investigate graphs of simultaneous equations (H).</li> <li>5. Represent inequalities on a number line</li> <li>6. Represent inequalities on a graph (H)</li> </ol>	<p><b>Next</b> GCSE Topic – Algebraic representation (linear, quadratic, cubic and more graphs)</p>	<ul style="list-style-type: none"> <li>• Inequality</li> <li>• Less than</li> <li>• Greater than</li> <li>• Coefficient</li> <li>• Reciprocal</li> <li>• Simultaneous</li> <li>• Quadratic</li> <li>• Roots</li> <li>• Axis</li> <li>• Parabola</li> <li>• Cubic</li> <li>• Root</li> <li>• Maximum/Minimum point</li> <li>• Intercept</li> <li>• Notation</li> </ul>	<p><b>Excelling</b> 1.2 I can represent both linear and quadratic inequalities graphically.</p> <p><b>Exceeding</b> 2.3 I can recognise, and justify, reciprocal graphs.</p> <p><b>Expected</b> 3.3 I can use equations to create coordinates of both linear and quadratic graphs.</p> <p><b>Emerging</b> 4.3 I can read and locate coordinates in all four quadrants.</p>
		<p><b>New</b> Interpreting and constructing quadratic graphs Identifying cubic and other graphs Represent inequalities on a number line and on a graph</p>		
		<p><b>Prior</b> Reading and constructing gradient of a line Identifying y-intercept Constructing lines in the format <math>y=mx+c</math> Find the equation of a graph from a given line Interpreting real-life graphs</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Plumber/builder standing charges</li> <li>• Taxi fares</li> <li>• Mobile phone tariffs</li> <li>• Conversion graphs</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Plotting incorrectly, especially (0, y).</li> <li>• Not using BIDMAS for substitution</li> <li>• Direction of x &amp; y axes (some think top to bottom, not bottom to top).</li> <li>• Multiplying with negatives.</li> </ul>	

Y9 lower

# Unit 9.1

# Forming and Solving Equations

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language		What I will be learning:
<p style="text-align: center;"><b>6 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Solve one- and two-step equations and inequalities (R).</li> <li>2. Solve one- and two-step equations and inequalities with brackets (R).</li> <li>3. Inequalities with negative coefficients of x.</li> <li>4. Solve equations with unknowns on both sides.</li> <li>5. Solve inequalities with unknowns on both sides.</li> <li>6. Solving equations and inequalities in context.</li> <li>7. Substituting into formulae and equations.</li> <li>8. Rearrange formulae (one-step).</li> <li>9. Rearrange formulae (two-step).</li> <li>10. Rearrange complex formulae including brackets and squared (H).</li> </ol>	<p><b>Next</b></p> <p>9.2 3D shapes 9.5 Testing conjectures 9.10 Pythagoras &amp; Trigonometry 9.11 Ratio and proportion</p>	<ul style="list-style-type: none"> <li>• Balance</li> <li>• Coefficient</li> <li>• Constant</li> <li>• Cubic</li> <li>• Curve</li> <li>• Equation</li> <li>• Expand</li> <li>• Expression</li> <li>• Formula</li> <li>• Formulae</li> <li>• Function</li> <li>• Gradient</li> <li>• Greater than</li> <li>• Identity</li> <li>• Inequality</li> <li>• Inverse</li> <li>• Less than</li> <li>• Linear</li> <li>• Negative</li> <li>• Positive</li> </ul>	<ul style="list-style-type: none"> <li>• Quadratic</li> <li>• Rearrange</li> <li>• Satisfy</li> <li>• Solution</li> <li>• Solve</li> <li>• Subject</li> <li>• Substitute</li> <li>• Term</li> <li>• Unknown</li> <li>• Variable</li> <li>• y-intercept</li> <li>• <math>y=mx+c</math></li> </ul>	<p><b>Excelling</b></p> <p>1.2 I can rearrange complex formulae. 1.4 I can form and solve multi-step equations with negative and fractional solutions in context.</p> <p><b>Exceeding</b></p> <p>2.4 I can form and solve equations and inequalities in context. 2.2 I can rearrange formulae with more than 1 step.</p> <p><b>Expected</b></p> <p>3.2 I can solve equations and inequalities with unknowns on both sides. 3.2 I can solve equations and inequalities with negative coefficients of x. 3.2 I can rearrange 1 step formulae.</p> <p><b>Emerging</b></p> <p>4.2 I can solve 1 &amp; 2 step equations with brackets. 4.2 I can solve 1 &amp; 2 step equations and inequalities.</p>
	<p><b>New</b></p> <p>Forming and solving equations Solving inequalities with unknowns on both sides of the inequality Rearrange formulae (Changing the subject)</p>				
	<p><b>Prior</b></p> <p>Expanding brackets Solving two step equations Solving equations with brackets Solving inequalities Solving equations with unknowns on both sides</p>				
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Computer programmer, research scientist, electrical engineer, architect, mechanical engineer, resource manager, builder, health care professional, food and agriculture, transportation optimisation, manufacturing. energy companies</li> <li>• <a href="https://sciencing.com/careers-use-linear-equations-6060294.html">https://sciencing.com/careers-use-linear-equations-6060294.html</a></li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Rules for calculating with negatives</li> <li>• Adding instead of multiplying when expanding</li> <li>• Use of BIDMAS particularly indices</li> <li>• That answers must be integers</li> <li>• That solutions must be integers/decimals.</li> </ul>		



# Unit 9.2

# Three Dimensional Shapes

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>6 lessons</b></p>	<ol style="list-style-type: none"> <li>Know names of 2-D and 3-D shapes.</li> <li>Recognise prisms.</li> <li>Accurate nets of cuboids and other 3-D shapes.</li> <li>Sketch and recognise nets of cuboids and other 3-D shapes.</li> <li>Plans and elevations.</li> <li>Find area of 2D shapes (R).</li> <li>Surface area of cubes and cuboids.</li> <li>Surface area of triangular prisms.</li> <li>Surface area of a cylinder.</li> <li>Volumes of cubes and cuboids.</li> <li>Volume of other 3-D shapes – prisms and cylinders.</li> <li>Explore volumes of cones, pyramids and spheres (H).</li> </ol>	<p><b>Next</b></p> <p>9.3 Construction and congruency 9.5 Testing conjectures 9.8 Angle deduction</p>	<ul style="list-style-type: none"> <li>Area</li> <li>Base</li> <li>Composite</li> <li>Cone</li> <li>Convert</li> <li>Cross-section</li> <li>Cube</li> <li>Cuboid</li> <li>Cylinder</li> <li>Depth</li> <li>Dimension</li> <li>Edge</li> <li>Elevation</li> <li>Equilateral</li> <li>Face</li> <li>Frustrum</li> <li>Height</li> <li>Isosceles</li> <li>Kite</li> <li>Length</li> <li>Net</li> <li>Parallelogram</li> <li>Plan</li> <li>Prism</li> <li>Quadrilateral</li> </ul>	<ul style="list-style-type: none"> <li>Rectangle</li> <li>Rhombus</li> <li>Scalene</li> <li>Sphere</li> <li>Square</li> <li>Surface area</li> <li>Trapezium</li> <li>Triangle</li> <li>Triangular prism</li> <li>Units</li> <li>Vertex</li> <li>Vertices</li> <li>Volume</li> <li>Width</li> </ul>
		<p><b>New</b></p> <p>Labelling prisms and parts of 3d shapes Constructing plans and elevations Sketch nets and 3d shapes from a net Calculating surface area Finding volume of 3d shapes Substitution values into a formula to find a volume</p>		<p><b>Excelling</b></p> <p>1.4 I can solve surface area &amp; volume problems in context. 1.3 I can explain how to construct nets. 1.3 I can justify methods used to calculate with volume &amp; surface area. 1.2 I can calculate the surface area &amp; volume of cones, pyramids, spheres &amp; frustrums. 1.4 I can describe the impact of moving parts of a shape on plans &amp; elevations.</p> <p><b>Exceeding</b></p> <p>2.1 I can recognise and draw the nets of common prisms &amp; pyramids. 2.2 I can calculate the surface area &amp; volume of common 3D shapes. 2.2 I can draw plans and elevations of complex 3D shapes and draw shapes, given their plan &amp; elevations.</p> <p><b>Expected</b></p> <p>3.1 I can recognise and draw the nets of common 3D shapes. 3.2 I can calculate the surface area &amp; volume of cubes &amp; cuboids. 3.2 I can calculate the area of a circle. 3.2 I can draw plans and elevations of basic 3D shapes.</p> <p><b>Emerging</b></p> <p>4.1 I can recognise common 2D &amp; 3D shapes 4.2 I can use a ruler accurately &amp; use formal letter terminology. 4.1 I can recognise parallel and perpendicular faces of 3D shapes. 4.2 I can calculate the area of common quadrilaterals and triangles.</p>
		<p><b>Prior</b></p> <p>Area of basic shapes Finding the perimeter of all 2d shapes Substituting values into a formula Finding the area of a compound shape Identifying key parts of a circle Calculating area of a circle and a trapezia</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>Paint needed for problem solving</li> <li>Liquid filling capacity</li> <li>Mechanic needs to know the volume of a cylinder on a motor bike</li> <li>Water board needing to know capacity of pipes</li> <li>Architecture</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>Area &amp; volume conversions are linear</li> <li>Incorrect units used</li> <li>Converting all dimensions to the same units of measure</li> <li>Orientation of plans &amp; elevations</li> </ul>	

# Unit 9.3

# Number Sense

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p><b>4 lessons (Higher)</b></p> <p><b>6 lessons (Middle/Lower)</b></p>	<ol style="list-style-type: none"> <li>Identifying and understand the difference between integers, real and rational numbers.</li> <li>Understand and use surds such as collecting like terms, operations with surds and basic rationalising of the denominator (H).</li> <li>Operations with directed numbers (R).</li> <li>Solve problems with integers such as operations and worded questions</li> <li>Solve problems with decimals.</li> <li>Finding HCF and LCM of two or more integers(R).</li> <li>Adding and subtracting fractions (R).</li> <li>Multiplying and dividing fractions (R).</li> <li>Solving problems with fractions including recap on operations with fractions</li> <li>Writing numbers in standard form (R).</li> </ol>	<p><b>Next</b></p> <p>9.5 Testing conjectures 9.6 Using percentages 9.7 Money 9.11 Ratio and Proportion 9.14 Probability 9.15 Algebraic representation</p> <p><b>New</b></p> <p>Identifying rational numbers Representing surds Operations with surds Rationalise denominators</p> <p><b>Prior</b></p> <p>LCM &amp; HCF Writing ordinary numbers in standard form Operations with fractions and decimals Operations with directed numbers Worded questions which require using the four operations</p>	<ul style="list-style-type: none"> <li>Base</li> <li>Denominator</li> <li><b>Equivalent</b></li> <li>Factor</li> <li>HCF</li> <li>Improper</li> <li>Index</li> <li>Indices</li> <li>Integer</li> <li><b>Irrational</b></li> <li><b>LCM</b></li> <li>Mixed number</li> <li>Multiple</li> <li>Numerator</li> <li>Order</li> <li>Ordinary form</li> <li>Power</li> <li>Proper</li> <li>Rational</li> <li>Real</li> <li><b>Standard form</b></li> <li><b>Terminating</b></li> </ul>	<p><b>Excelling</b></p> <p>1.2 I can work fluently both numerically and algebraically. i.e. BIDMAS and multi step calculations involving decimals, fractions and surds; and form and use algebraic equations and formula to solve mathematical problems correctly</p> <p><b>Exceeding</b></p> <p>2.4 I can plan and solve more complex problems involving HCF, LCM, fractions, decimals and time.</p> <p><b>Expected</b></p> <p>3.4 I can plan and solve simple problems using HCF and LCM.</p> <p><b>Emerging</b></p> <p>4.4 I can identify the skills needed to solve a problem and check if results are sensible.</p>
<p><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>Astronomy</li> <li>Biology</li> <li>Financial Maths</li> <li>Representing large or small numerical values</li> <li>Interpreting answers on a calculator</li> </ul>			<p><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>Students often mix <math>\frac{1}{3}</math> up with 30% or 33%.</li> <li>Thinking they must have a common denominator to multiply or divide a fraction.</li> <li>Not converting mixed fractions to improper fractions before multiplying or dividing</li> <li>Negative and Minus – understanding the difference between these key words. Understanding that one is a operation.</li> <li>Thinking that positive numbers have only one square root</li> </ul>	

# Unit 9.4

# Constructions and Congruency

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language		What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Draw and measure angles (R).</li> <li>2. Construct and interpret scale drawings (R).</li> <li>3. Locus of distance from a point.</li> <li>4. Locus of distance from a straight line/shape.</li> <li>5. Locus equidistant from two points.</li> <li>6. Construct a perpendicular bisector.</li> <li>7. Construct a perpendicular from a point.</li> <li>8. Construct a perpendicular to a point.</li> <li>9. Locus of distance from two lines.</li> <li>10. Construct an angle bisector.</li> <li>11. Construct triangles from given information (R).</li> <li>12. Identify congruent figures.</li> <li>13. Explore congruent triangles including answering exam questions on proving congruency</li> </ol>	<p><b>Next</b> 9.5 Testing Conjectures 9.10 Pythagoras and Trigonometry 9.13 Enlargement and Similarity</p>	<ul style="list-style-type: none"> <li>• Angle</li> <li>• Area</li> <li>• Base</li> <li>• Bisect</li> <li>• Bisector</li> <li>• Circumference</li> <li>• Composite</li> <li>• Cone</li> <li>• Congruency</li> <li>• Convert</li> <li>• Cross-section</li> <li>• Cube</li> <li>• Cuboid</li> <li>• Cylinder</li> <li>• Depth</li> <li>• Dimension</li> <li>• Edge</li> <li>• Equidistant</li> <li>• Equilateral</li> <li>• Face</li> <li>• Height</li> <li>• Isosceles</li> <li>• Kite</li> <li>• Length</li> <li>• Locus</li> <li>• Loci</li> </ul>	<ul style="list-style-type: none"> <li>• Net</li> <li>• Parallel</li> <li>• Parallelogram</li> <li>• Perpendicular</li> <li>• Prism</li> <li>• Quadrilateral</li> <li>• Rectangle</li> <li>• Rhombus</li> <li>• Scalene</li> <li>• Sketch</li> <li>• Square</li> <li>• Surface area</li> <li>• Trapezium</li> <li>• Triangle</li> <li>• Triangular prism</li> <li>• Units</li> <li>• Vertex</li> <li>• Vertices</li> <li>• Volume</li> <li>• Width</li> </ul>	<p><b>Excelling</b> 1.2 I can create congruent shapes. 1.3 I can describe fluently how to draw a locus of point(s), line(s) and shapes.</p> <p><b>Exceeding</b> 2.2 I can draw a perpendicular line from and to a point. 2.2 I can draw the locus of a distance from a shape, 2 points and 2 lines. 2.3 I can explain whether or not 2 shapes are congruent. 2.3 I can explain basic loci.</p> <p><b>Expected</b> 3.2 I can bisect an angle and draw a perpendicular bisector of a line. 3.2 I can draw the locus of a distance from a point and a straight line. 3.2 I can construct SSS, SAS, ASA triangles and recognise their congruence. 3.1 I can recognise congruent shapes.</p> <p><b>Emerging</b> 4.2 I can use a ruler &amp; protractor to draw accurately 4.3 I can draw and interpret scale drawings.</p>
		<p><b>New</b> Understanding congruency The correct technique to answer congruency Constructing Loci</p>			
		<p><b>Prior</b> Interior angles of a triangle and quadrilateral Identifying polygons Calculating the interior and exterior angles of any polygon Constructing angle and perpendicular bisectors</p>			
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Product/package design</li> <li>• Architecture</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Missing faces from nets/surface area calculations</li> <li>• Where a compass is held, which leads to errors</li> <li>• Leaving construction lines on all mathematical drawings</li> </ul>		

# Unit 9.5

# Using Percentages

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Use the equivalence of fractions, decimals and percentages (R).</li> <li>2. Calculate percentage increases and decreases (R).</li> <li>3. Express a change as a percentage (R).</li> <li>4. Solve “reverse” percentage problems.</li> <li>5. Recognise and solve percentage problems (non-calculator).</li> <li>6. Recognise and solve percentage problems (calculator) (R).</li> <li>7. Solve problems with repeated percentage change (H).</li> </ol>	<p><b>Next</b> 9.7 Money 9.12 Rates of change GCSE topics: Number, Growth &amp; Decay, Financial maths</p>	<ul style="list-style-type: none"> <li>• Appreciation</li> <li>• <b>Compound</b></li> <li>• Decimal</li> <li>• Decrease</li> <li>• Denominator</li> <li>• <b>Depreciation</b></li> <li>• Equivalent</li> <li>• Fraction</li> <li>• Gross</li> <li>• Increase</li> <li>• <b>Interest</b></li> <li>• <b>Inverse</b></li> <li>• <b>Multiplier</b></li> <li>• NET</li> <li>• Numerator</li> <li>• Percentage</li> <li>• <b>Simple</b></li> </ul>	<p><b>Excelling</b> 1.2 I can recognise where calculate compound interest and depreciation are used and apply the formulae.</p> <p><b>Exceeding</b> 2.2 I can calculate with reverse percentage multipliers.</p> <p><b>Expected</b> 3.2 I can use decimal multipliers to calculate percentages.</p> <p><b>Emerging</b> 4.4 I can check if results are sensible using fractions. i.e. 54% is the answer slightly more than half.</p>
		<p><b>New</b> Solving problems with repeated percentage change Reverse percentages</p>		
		<p><b>Prior</b> Applying a decimal multiplier on a calculator Calculating percentage change Identifying a range of methods to calculate percentage and find the most efficient</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Mortgages, borrowing &amp; lending money</li> <li>• Sales, removing VAT</li> <li>• Builder/plumber/electrician bills (cost, cost + VAT, labour)</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• When increasing by 110% to multiply by 1.1</li> <li>• <math>0.3 = 3\%</math></li> </ul>	

# Unit 9.6

# Maths and Money

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Solve problems with bills and bank statements.</li> <li>2. Calculate simple interest.</li> <li>3. Calculate compound interest.</li> <li>4. Solve problems with Value Added Tax.</li> <li>5. Calculate wages and taxes.</li> <li>6. Solve problems with exchange rates.</li> <li>7. Solve unit pricing problems.</li> <li>8. Converting between currencies</li> </ol>	<p><b>Next</b> GCSE topics: Number, Multiplicative reasoning, statistical analysis</p>	<ul style="list-style-type: none"> <li>• Financial</li> <li>• VAT</li> <li>• <b>Gross</b></li> <li>• <b>Net</b></li> <li>• Interest</li> <li>• <b>Depreciation</b></li> <li>• <b>Unit Pricing</b></li> <li>• <b>Profit</b></li> <li>• Exchange Rate</li> </ul>	<p><b>Excelling</b> 1.1 I can remember a wide range of facts across year 7, 8 and 9 topics and apply them</p> <p><b>Exceeding</b> 2.2 I can work fluently numerically. i.e. BIDMAS and multi step calculations involving decimals and money and be able to manipulate algebra to solve monetary problems.</p> <p><b>Expected</b> 3.3 I can describe and use mathematical terminology and calculations to support my work.</p> <p><b>Emerging</b> 4.4 I can identify the skills needed to solve a problem and check that results are sensible.</p>
		<p><b>New</b> Understanding interest Calculating simple and compound interest</p>		
		<p><b>Prior</b> Interpreting bank statements Calculating percentages with and without a calculator</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Financial maths</li> <li>• Calculating VAT, income and interest</li> <li>• Applying interest and understanding it's purpose</li> <li>• Identifying the best value deals which include percentage increase/decrease</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Understanding key words such as debit and credit</li> <li>• Not answering to 2 decimal places</li> </ul>	

# Unit 9.7

# Angle Deduction

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Angles in parallel lines (R).</li> <li>2. Solving angle problems (using chains of reasoning).</li> <li>3. Angle problems with algebra.</li> <li>4. Conjectures with angles.</li> <li>5. Conjectures with shapes including interior and exterior angles</li> <li>6. Links constructions and geometrical reasoning (H).</li> </ol>	<p><b>Next</b> 9.10 Pythagoras &amp; Trigonometry 9.13 Enlargement and Similarity</p>	<ul style="list-style-type: none"> <li>• Alternate</li> <li>• Angles</li> <li>• Chord</li> <li>• Co-interior</li> <li>• Corresponding</li> <li>• Diameter</li> <li>• Exterior</li> <li>• Interior</li> <li>• Isosceles</li> <li>• Notation</li> <li>• Parallel</li> <li>• Perpendicular</li> <li>• Point</li> <li>• Radius</li> <li>• Sum</li> <li>• Supplementary</li> <li>• Straight line</li> <li>• Tangent</li> </ul>	<p><b>Excelling</b> 1.1 I can recall a wide range of facts across year 7, 8 and 9 angles and geometric reasoning and apply them to multi-step problems.</p> <p><b>Exceeding</b> 2.3 I can justify using mathematical terminology and calculations to support multi-step problems.</p> <p><b>Expected</b> 3.3 I can describe using mathematical terminology and calculations to support simple problems in parallel lines.</p> <p><b>Emerging</b> 4.4 I can check if results are sensible (ie angle size being acute, obtuse etc).</p>
		<p><b>New</b> Exam technique with providing reasoning for angles Applying conjectures to shape and angle</p>		
		<p><b>Prior</b> Interior and exterior angles for polygons Relationships on angles on parallel lines Angles on a straight line and around a point Vertically opposite angles</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Architecture.</li> <li>• Building and design.</li> <li>• Model making.</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Correctly identifying vertically opposite angles</li> <li>• Not referring to alternate, corresponding and interior angles as F, Z and C angles</li> <li>• Applying the angle fact that interior and exterior angles equal to 180</li> </ul>	

# Unit 9.8

# Rotation and Translation

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Identify the order of rotational symmetry of a shape.</li> <li>2. Compare and contrast rotational symmetry with line symmetry.</li> <li>3. Rotate a shape about a point on a shape.</li> <li>4. Rotate a shape about a point not on a shape.</li> <li>5. Translate points and shapes by a given vector.</li> <li>6. Describe transformations which contain rotation and translation</li> <li>7. Compare rotation and reflection of shapes.</li> <li>8. Find the result of a series of transformations (H).</li> <li>9. Introduction to operations with vectors (H)</li> </ol>	<p><b>Next</b> GCSE topic – Transformations GCSE topic – Vectors</p>	<ul style="list-style-type: none"> <li>• Rotate</li> <li>• Translate</li> <li>• Column vector</li> <li>• Angle</li> <li>• Direction</li> <li>• Transformation</li> <li>• Clockwise</li> <li>• Anti-clockwise</li> <li>• Centre of rotation</li> <li>• Symmetry</li> <li>• Order of rotation</li> </ul>	<p><b>Excelling</b> 1.3 I can recall and use the correct mathematical terminology to describe multi-step transformations.</p> <p><b>Exceeding</b> 2.3 I can recall and use the correct mathematical terminology to describe rotations and reflections.</p> <p><b>Expected</b> 3.4 I can break down the skills needed to rotate a shape about a given point.</p> <p><b>Emerging</b> 4.4 I can identify the skills used in rotational and reflectional symmetry.</p>
		<p><b>New</b> Describing transformations with the correct GCSE exam technique</p>		
		<p><b>Prior</b> Reflecting a shape from a mirror line Identifying lines of symmetry Rotating shapes from a given direction Identifying clockwise and anti-clockwise</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Graphic design</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Clockwise and anti-clockwise</li> <li>• If the angle of rotation is 180° it does not need to specify which direction of rotation</li> <li>• Interpreting the column vector incorrectly for translation</li> </ul>	

# Unit 9.9

# Pythagoras' Theorem and Trigonometry

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<b>6 lessons</b>	<ol style="list-style-type: none"> <li>1. Squares and square roots (R).</li> <li>2. Identify the hypotenuse of a right-angled triangle.</li> <li>3. Determine whether a triangle is right-angled.</li> <li>4. Calculate the hypotenuse of a right-angles triangle.</li> <li>5. Calculate missing sides in a right-angled triangle.</li> <li>6. Use Pythagoras' theorem on coordinate axes.</li> <li>7. Explore proofs of Pythagoras' theorem.</li> <li>8. Use Pythagoras' theorem in 3-D shapes (H).</li> <li>9. Applying trigonometry to find the missing length of a right angled triangle</li> <li>10. Applying trigonometry to find the missing angle of a right angled triangle</li> <li>11. Forming and solving a trigonometry question</li> </ol>	<p><b>Next</b> GCSE topic – Trigonometry GCSE topic – Bounds and More Trigonometry</p> <hr/> <p><b>New</b> Applying Pythagoras theorem Applying trigonometry to find the missing length or angle of a right angled triangle</p> <hr/> <p><b>Prior</b> Calculating indices and roots Constructing SAS triangles</p>	<ul style="list-style-type: none"> <li>• Hypotenuse</li> <li>• Theorem</li> <li>• Formula</li> <li>• Substitute</li> <li>• Square</li> <li>• Square root</li> <li>• Manipulate</li> <li>• Perpendicular</li> <li>• Adjacent</li> <li>• Opposite</li> </ul>	<p><b>Excelling</b> 1.4 I can solve complex problems involving Pythagoras, including in 3 dimensions.</p> <p><b>Exceeding</b> 2.3 I can use Pythagoras's Theorem to justify whether a triangle is a right angle.</p> <p><b>Expected</b> 3.2 I can calculate the missing side of a right angle triangle using Pythagoras' Theorem.</p> <p><b>Emerging</b> 4.2 I can calculate square and square root numbers. 4.4 I can identify the hypotenuse of a right angled triangle.</p>
<b>Real-life applications and Problem Solving</b> <ul style="list-style-type: none"> <li>• Construction</li> <li>• Location services</li> <li>• Astronomy</li> </ul>			<b>Misconceptions</b> <ul style="list-style-type: none"> <li>• Correctly identifying the hypotenuse</li> <li>• Using the wrong rule for trigonometry</li> <li>• Using the inverse function to find a missing angle</li> </ul>	



# Unit 9.10

# Solving Ratio & Proportional

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Solve problems with direct proportion (R).</li> <li>2. Direct proportion and conversion graphs (R).</li> <li>3. Solve problems with inverse proportion.</li> <li>4. Graphs of inverse relationships (H).</li> <li>5. Solve ratio problems given the whole or a part (R).</li> <li>6. Solve “best buy” problems.</li> <li>7. Solve problems with ratio and algebra (H).</li> </ol>	<p><b>Next</b></p> <p>9.12 Rates of Change 9.13 Enlargement and Similarity 9.15 Algebraic Representation</p>	<ul style="list-style-type: none"> <li>• Proportion</li> <li>• Indirect</li> <li>• Inverse</li> <li>• Multiplier</li> <li>• Expression</li> <li>• Equation</li> <li>• <b>Direct</b></li> <li>• <b>Inverse</b></li> <li>• Ratio</li> <li>• <b>Unit price</b></li> <li>• <b>Relationship</b></li> <li>• <b>Conversion graphs</b></li> </ul>	<p><b>Excelling</b></p> <p>1.2 I can use algebra and/or bar models to solve inverse proportion problems.</p> <p><b>Exceeding</b></p> <p>2.2 I can use algebra and/or bar models to solve direct proportion problems.</p> <p><b>Expected</b></p> <p>3.3 I can draw and use direct proportion graphs, including conversion graphs.</p> <p><b>Emerging</b></p> <p>4.3 I can explain, in mathematical terms, the relationship between two variables in direct proportion.</p>
		<p><b>New</b></p> <p>Indirect proportion – solving numerical, algebraically and graphical problems Best buy problems Problems including ratio and algebra</p>		
		<p><b>Prior</b></p> <p>Solving multiplicative reasoning problems Writing ratios in the format n:1 Comparing ratios to fractions Represent gradient as a ratio</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Currency conversion</li> <li>• Conversion of distances for speeds</li> <li>• Best buy – Identifying the best value for money products</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Using ratios to answer probability questions – this is not suitable.</li> <li>• Fractions and decimals cannot be used in ratios – they can when using the form 1:n.</li> </ul>	

# Unit 9.11

# Rates of Change

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<b>4 lessons</b>	<ol style="list-style-type: none"> <li>1. Solve speed, distance and time problems without a calculator.</li> <li>2. Solve speed, distance and time problems with a calculator.</li> <li>3. Construct and interpret distance/time graphs.</li> <li>4. Solve problems with density, mass and volume.</li> <li>5. Solve flow (volume) problems and their graphs (capacity/volume).</li> <li>6. Rates of change including financial problems, real-life graphs and time problems</li> <li>7. Convert compound units including time, distance, mass, area and volume</li> </ol>	<p><b>Next</b> GCSE topic – Area and volume including metric conversions Data analysis such as converting between speed, time and distance</p> <hr/> <p><b>New</b> Time/Distance graphs Converting between all compound units Calculating speed, distance and time Calculating density, mass and volume</p> <hr/> <p><b>Prior</b> Calculations from a formula triangle Metric conversions Ratio problems Financial problems Conversion graphs</p>	<ul style="list-style-type: none"> <li>• Speed</li> <li>• Distance</li> <li>• Time</li> <li>• Minutes</li> <li>• Hours</li> <li>• Convert</li> <li>• Conversion</li> <li>• Kilometres</li> <li>• Miles</li> <li>• Metres</li> <li>• Grams</li> <li>• Mass</li> <li>• Formula</li> <li>• Volume</li> <li>• Millilitre</li> <li>• Rate of change</li> <li>• Density</li> <li>• Acceleration</li> </ul>	<p><b>Excelling</b> 1.1 I can convert between units within compound units.</p> <p><b>Exceeding</b> 2.3 I can justify using mathematical terminology and calculations to support my reasoning for calculation to solve problems.</p> <p><b>Expected</b> 3.1 I can form the formulae triangles for compound measures using given units.</p> <p><b>Emerging</b> 4.4 I understand that the gradient of a SDT graph indicates the speed.</p>
<b>Real-life applications and Problem Solving</b>			<b>Misconceptions</b>	
<ul style="list-style-type: none"> <li>• Construction – Metric conversions</li> <li>• Converting between speed, time and distance</li> <li>• Financial maths</li> </ul>			<ul style="list-style-type: none"> <li>• Using formulae triangles correctly</li> <li>• All metric conversions do not use 100</li> </ul>	

# Unit 9.12

# Enlargement and Similarity

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>6 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Recognise enlargement and similarity.</li> <li>2. Enlarge a shape by a given positive integer scale factor.</li> <li>3. Enlarge a shape by a positive integer scale factor from a point.</li> <li>4. Enlarge a shape by a positive fractional scale factor.</li> <li>5. Enlarge a shape by a negative scale factor (H).</li> <li>6. Work out missing sides and angles in a pair of given similar shapes.</li> <li>7. Solve problems with similar triangles</li> <li>8. Explore ratios in right-angled triangles (H).</li> <li>9. Solve problems with similar shapes which include area, surface area and volume</li> <li>10. Proofs of congruency and similarity (H)</li> </ol>	<p><b>Next</b></p> <p>GCSE Topic – Ratio and Proportion GCSE Topic – Transformations</p>	<ul style="list-style-type: none"> <li>• Enlargement</li> <li>• Similar shapes</li> <li>• Equi-angular</li> <li>• Scale factor</li> <li>• Negative</li> <li>• Fractional</li> <li>• Integer</li> <li>• Centre of enlargement</li> <li>• Ratio</li> </ul>	<p><b>Excelling</b></p> <p>1.3 I can construct justifications as to how/why shapes are similar using the correct mathematical terminology with both negative and fractional scale factors.</p> <p><b>Exceeding</b></p> <p>2.3 I can explain how a shape has been enlarged about a centre of enlargement.</p> <p><b>Expected</b></p> <p>3.2 I can explain if a shape has been enlarged by a positive scale factor.</p> <p><b>Emerging</b></p> <p>4.2 I can enlarge a shape by a positive integer scale factor.</p>
		<p><b>New</b></p> <p>Enlarging from a centre of enlargement Enlarging by a fractional and negative scale factor Solving problems with similar shapes</p>		
		<p><b>Prior</b></p> <p>Enlarging from a given ratio Using a ratio to find a missing value Plotting coordinates Multiplying by decimals and fractions</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Problem solving using ratio</li> <li>• Enlarging from a ratio which is the skill used for conversions including currency</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Similar shapes problems which contain finding missing angles</li> <li>• Finding the area and volume scale factor for similar shapes</li> <li>• The correct method to find surface area</li> </ul>	

# Unit 9.13

# Probability

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Single event probability (R).</li> <li>2. Relative frequency – include convergence.</li> <li>3. Listing expected outcomes.</li> <li>4. Calculating the probability of independent events.</li> <li>5. Use tree diagrams to calculate two or more event probability (H).</li> <li>6. Use tree diagrams to solve “without replacement” problems (H).</li> <li>7. Use diagrams to work out probability.</li> </ol>	<p><b>Next</b> GCSE topic - Probability</p>	<ul style="list-style-type: none"> <li>• Affect</li> <li>• Biased</li> <li>• Equally likely</li> <li>• Event</li> <li>• Expected</li> <li>• Experiment</li> <li>• Fair</li> <li>• Frequency</li> <li>• Independent</li> <li>• Intersection</li> <li>• Outcome</li> <li>• Probability</li> <li>• Product</li> <li>• Relative frequency</li> <li>• Replacement</li> <li>• Sample Space</li> <li>• Trial</li> <li>• Two-way table</li> <li>• Union</li> <li>• Venn Diagram</li> </ul>	<p><b>Excelling</b> 1.2 I can calculate the probability of multiple events happening using probability trees.</p> <p><b>Exceeding</b> 2.2 I can calculate the probability of a single event happening using fractions, decimals and percentages, from different visual representations.</p> <p><b>Expected</b> 3.2 I understand that probability must be between 0 &amp; 1 or equivalent.</p> <p><b>Emerging</b> 4.3 I can explain worded probability lines.</p>
		<p><b>New</b> Relative frequency Constructing tree diagrams to calculate probability</p>		
		<p><b>Prior</b> Representing single event probability Adding and multiplying fractions</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Interpreting and understanding probability</li> <li>• Stock Market</li> <li>• Weather</li> <li>• Sport Statistics</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Adding fractions for calculate probability</li> <li>• Answering probability as a worded description</li> </ul>	

# Unit 9.14 Algebraic Representation

Time Allocation	Skills and Knowledge	Prior learning to support Areas to Interleave and revisit	Keywords - Be explicitly clear on terminology and language	What I will be learning:
<p style="text-align: center;"><b>4 lessons</b></p>	<ol style="list-style-type: none"> <li>1. Interpret and construct linear graphs in the format <math>y=mx+c</math> (R)</li> <li>2. Draw and interpret quadratic graphs.</li> <li>3. Interpret graphs, including reciprocal and piece-wise.</li> <li>4. Investigate graphs of simultaneous equations (H).</li> <li>5. Represent inequalities on a number line</li> <li>6. Represent inequalities on a graph (H)</li> </ol>	<p><b>Next</b> GCSE Topic – Algebraic representation (linear, quadratic, cubic and more graphs)</p>	<ul style="list-style-type: none"> <li>• Inequality</li> <li>• Less than</li> <li>• Greater than</li> <li>• Coefficient</li> <li>• Reciprocal</li> <li>• Simultaneous</li> <li>• Quadratic</li> <li>• Roots</li> <li>• Axis</li> <li>• Parabola</li> <li>• Cubic</li> <li>• Root</li> <li>• Maximum/Minimum point</li> <li>• Intercept</li> <li>• Notation</li> </ul>	<p><b>Excelling</b> 1.2 I can represent both linear and quadratic inequalities graphically.</p> <p><b>Exceeding</b> 2.3 I can recognise, and justify, reciprocal graphs.</p> <p><b>Expected</b> 3.3 I can use equations to create coordinates of both linear and quadratic graphs.</p> <p><b>Emerging</b> 4.3 I can read and locate coordinates in all four quadrants.</p>
		<p><b>New</b> Interpreting and constructing quadratic graphs Identifying cubic and other graphs Represent inequalities on a number line and on a graph</p>		
		<p><b>Prior</b> Reading and constructing gradient of a line Identifying y-intercept Constructing lines in the format <math>y=mx+c</math> Find the equation of a graph from a given line Interpreting real-life graphs</p>		
<p style="text-align: center;"><b>Real-life applications and Problem Solving</b></p> <ul style="list-style-type: none"> <li>• Plumber/builder standing charges</li> <li>• Taxi fares</li> <li>• Mobile phone tariffs</li> <li>• Conversion graphs</li> </ul>			<p style="text-align: center;"><b>Misconceptions</b></p> <ul style="list-style-type: none"> <li>• Plotting incorrectly, especially (0, y).</li> <li>• Not using BIDMAS for substitution</li> <li>• Direction of x &amp; y axes (some think top to bottom, not bottom to top).</li> <li>• Multiplying with negatives.</li> </ul>	