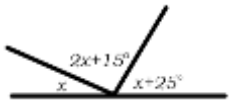
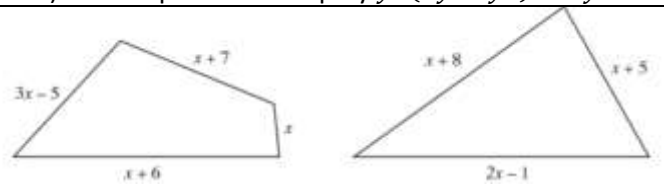
Year 8 – NUMBER - Working with Numbers – Chapter 1

Level	I can...	Example	MW clip	Start of topic	End of topic
5	I can use the laws of indices for index form number raised to a power.	Simplify $(3^4)^3$	*82, 131*		
4	I can work out the LCM and the HCF of two numbers using prime factors.	Write 24 and 54 as products of primes. Hence find the HCF & LCM of 24 and 54	*78; 79; 80*		
	I can use the laws of indices to multiply & divide numbers written in index form	Simplify $5^3 \times 5^4$ Simplify $9^7 \div 9^3$			
3	I can multiply and divide negative numbers.	Work out -6×5	*68*		
	I can apply BIDMAS for calculations including indices	Work out $2^3 + 3 \times 5$	*75*		
	I can find the lowest common multiple (LCM) for pairs of numbers.	Find the LCM of 12 and 20	*80*		
	I can find the highest common factor (HCF) for pairs of numbers.	Find the HCF of 24 and 40	*79*		
	I can write a number as the product of its prime factors.	Write 126 as a product of its prime factors	*78*		
2	I can order a list of positive and negative numbers, and use < and > signs	Insert < or > to make this statement true: $-3 \ldots -5$	*2; 23*		
	I can find square and cube numbers and square and cube roots.	Find a) 4^3 b) $\sqrt{9}$ c) $\sqrt[3]{64}$	*81*		
	I can find common factors for pairs of numbers.	List the common factors of 24 and 40	*28*		
	I can use a calculator to work out powers of numbers.	Use a calculator to find 3^8	*29*		
	I can write down the square of any whole number up to 16^2	Write down the square numbers from 1^2 to 16^2	*29*		
	I can add and subtract with negative numbers	Work out $-3 + -2 + 4$	*68*		

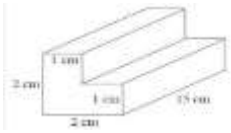
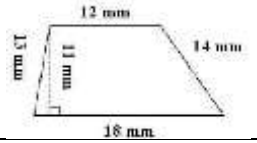
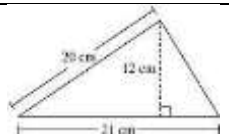
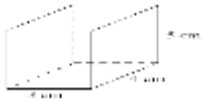
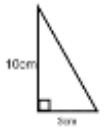
Year 8 – ALGEBRA – Equations and Formulae – Chapter 2

Level	I can...	Example	MW clips	Start of topic	End of topic
4	Solve equations with unknowns on both sides, where the solution is a fraction or a negative integer	Solve a) $2x - 9 = 8x + 3$ b) $5 - 7y = 2 - 3y$	*135*		
	Find an unknown when it's not the subject	$T = 3x + n$ find x when $T = 34$ and $n = 1$			
3	Solve equations with unknowns on both sides, where the solution is a positive integer	a) $4x + 3 = x + 15$ b) $5(p + 4) = 3p - 3$	*135*		
	Solve equations involving brackets and divisor lines	Solve a) $\frac{n-1}{2} = 4$ b) $5(y + 2) = 60$	*36; 135*		
	Form and solve equations from written/geometrical information involving one/two operations.	 Form an equation and solve for x	*137*		
2	Solve equations involving two operations	Solve a) $4x - 1 = 11$ b) $\frac{m}{3} + 2 = 7$	*36; 135*		
	Solve equations involving one operation	Solve a) $3x = 33$ b) $y - 7 = 11$ c) $\frac{n}{2} = 5$ d) $25 = t^2$	*36; 135*		

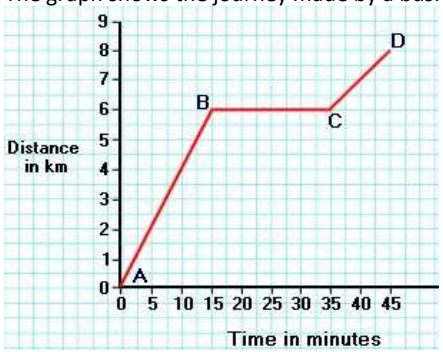
Year 8 – ALGEBRA – Algebraic manipulation – Chapter 3

Level	I can...	Example	MW clips	Start of topic	End of topic
5	Write and simplify expressions involving brackets and powers	i) Factorise fully $20x^4 - 12x^7$ ii) Expand and simplify $y^3(2y + y^2) + 3y^4$	*134*		
	Form and solve more complex equations from written/geometrical information	 The perimeters of these shapes are equal. Find x	*137*		
4	Multiply an algebraic term over a bracket	i) Expand and simplify $2t(4t + 3)$ ii) Expand and simplify $(3m)^2$	*131; 134*		
	Simplify algebraic expressions involving cubes and other powers	Simplify i) $3k \times 4k^2$ ii) $\frac{20x^5}{5x^2}$ iii) $(n^3)^2$	*34; 35*		
3	Factorise linear expressions	Factorise 6p+10	*94*		
	Multiply a negative number over a bracket	Expand $-2(3x - 5)$	*93*		
	Write and simplify algebraic expressions involving squares	Simplify $6y \times 2y$	*34*		
	Understand what is an identity (≡)	Give an example of an algebraic identify			
2	Multiply a value over a bracket	Expand $3(x + 4)$	*93*		
	Substitute integer values into expressions with up to two operations	Find the value of 8k when k=5 Evaluate 2x – y when x=3 and y= -2	*95*		
	Form algebraic expressions using two operations	Write these expressions as simply as possible I) $3 \times n - 4$ ii) $a \times b \div 4$	*34*		
	Simplify by collecting like terms	Simplify $3f + 7f - 9f$	*33*		

Year 8 – GEOMETRY – 2D shapes & 3D solids - Chapter 4

Level	I can...	Example	MW clips	Start of topic	End of topic
4	Calculate the volume of simple prisms made from cubes & cuboids	Find i) the area of cross-section ii) the volume of the prism iii) he surface area of the prism 	*119*		
	Calculate the surface area of simple prisms made from cubes & cuboids		*44; 114*		
3	Find the area of a trapezium and compound shapes	Find the area of this trapezium 	*56*		
	Convert between metric units of length, area, volume & capacity	iii) convert 2.5*km* into *m* ii) convert 3m^2 into cm^2	*112*		
	Find the area of cross-section of a prism	*See grade 4 question*	*53; 54; 55*		
	Draw plans & elevations of simple 3D shapes	Draw the plan, front & side elevation of the grade 4 prism			
	Deduce & analyse the properties of 3D shapes through their 2D representations.	Draw the net of the grade 2 cuboid			
2	Find the area of a triangle and parallelogram	  Find the areas of these shapes	*53; 54; 55*		
	Find the volume of a cuboid	For this cuboid, find the i) volume and ii) the surface area 	*115*		
	Find the surface area of a cuboid		*44; 114*		
	Find the area of a rectangle and right-angled triangle	Find the area of these  	*53; 54*		

Year 8 – ALGEBRA - Proportions and graphs – Chapter 5

Level	I can...	Example	MW clips	Start of topic	End of topic
4	Interpret information given in a range of linear and non-linear graphs	Pearson international Progress 8 - Chapter 5	*8; 42; 105; 143; 216;*		
	Interpret & criticise a variety of graphs (misleading graphs)	Pearson international Progress 8 - Chapter 5			
3	Identify direct proportion from a graph.	Pearson international Progress 8 - Chapter 5			
	Draw and interpret distance-time and velocity–time graphs.	Pearson international Progress 8 - Chapter 5			
	Interpret information from a complex real-life graph (fixed charge/unit cost), read values and discuss trends.	Pearson international Progress 8 - Chapter 5			
	Construct a table of values for a conversion graph and use it to solve problems	1GBP = 1.5 USD Construct a graph and use it to convert 10 USD into GBP			
	Find average speed from a distance-time graph	The graph shows the journey made by a bus.  i) How far does the bus travel in the first 15 minutes? ii) What is its average speed during the first 15 minutes? iii) What is the bus doing between points B and C on the graph? iv) During which part of the journey is the bus travelling fastest? How do you know?			
2	Interpret simple information from a distance-time graph				
	Use and interpret a given conversion graph	a) Complete the table b) Draw the graph for the table c) Is the cost directly proportional to the hours? d) Use the graph to find the cost for 6 hours			
	Recognise values that are directly proportional				
	Draw a graph from a given table of value				

Year 8 – NUMBER – Fractions and decimals – Chapter 6

Level	I can...	Example	MW clips	Start of topic	End of topic
7	Convert recurring decimals to exact fractions using algebra	Convert using algebra (i) *0.7777…* (ii) *0.1222…*	*177*		
5	Solve problems with fractions and decimals including BIDMAS				
	Multiply & divide with Mixed numbers	Calculate (i) $3\frac{3}{5} \times 1\frac{2}{3}$ (ii) $5\frac{2}{3} \div 2\frac{1}{10}$	*73; 74*		
4	Add & subtract with Mixed numbers	Calculate (i) $2\frac{1}{3} + 1\frac{1}{4}$ (ii) $3\frac{4}{5} - 1\frac{2}{3}$	*71*		
3	Convert between fractions & decimals by division	Convert (i) 0.06 into a simplified fraction (ii) $\frac{1}{20}$ into a decimal by division	*84*		
	Know the denominators of simple fractions that produce recurring decimals and of those that do not.	Which fraction will give a recurring decimal: (a) $\frac{3}{15}$ or (b) $\frac{2}{11}$			
	Multiply and divide fractions by integers or by fractions	Calculate (i) $\frac{2}{3}$ of 66 (ii) $4 \times \frac{3}{5}$ (iii) $\frac{2}{3} \times \frac{4}{5}$ (iv) $9 \div \frac{1}{3}$ (v) $\frac{2}{3} \div \frac{1}{4}$	*72; 73; 74*		
	Write the reciprocal of an integer or fraction	Write the reciprocal of (i) 4 (ii) $\frac{2}{3}$ (iii) $1\frac{1}{5}$	*76*		
	Add and subtract with proper fractions	Calculate (i) $\frac{3}{5} + \frac{4}{7}$ (ii) $\frac{4}{5} - \frac{3}{4}$	*71*		
	Multiply and divide by 0.1, 0.01 & 0.001	Work out (i) 34 x 0.01 (ii) 0.23 ÷ 0.1			
	Divide by decimals - non-calculator	(i) Work out 67.8 ÷ 1.2 (ii) Work out 39 ÷ 0.75 to 1dp	*67*		
	Multiply by decimals - non-calculator	Work out (i) 341 x 1.2 (ii) 4.78 x 3.7	*66*		
2	Convert between mixed numbers & improper fractions	Convert (i) $\frac{20}{6}$ into a mixed number (ii) $3\frac{4}{5}$ into an improper fraction			
	Multiply and divide by 10, 100 & 1000	Work out (i) 3.45 x 10 (ii) 5.6 ÷ 100	*30*		
	Multiplication and division using written methods	Work out (i) 45 x 6 (ii) 189 ÷ 3	*19; 20*		
	Round numbers to a specified number of decimal places.	Round 8.0643 to (i) 1d.p (ii) 2d.p (iii) 3d.p	*32*		
	Round numbers to the nearest 10,100 & 1000	i) Round 34 to the nearest ten (ii) Round 1740 to the nearest thousand	*31*		

Year 8 – STATISTICS – Probability – Chapter 7

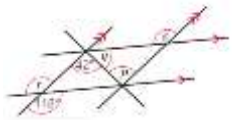
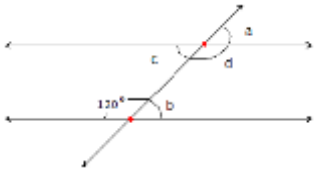
<table>
<tr><th>Level</th><th>I can...</th><th>Example</th><th>MW clips</th><th>Start of topic</th><th>End of topic</th></tr>
<tr><td>4</td><td>Predict how many times something happens given the probability</td><td>a) A six-sided dice is thrown 300 times.
How many times would you expect to throw a ‘five’ or a ‘six’?
b) The biased spinner in level 3 is used 500 times. How many times would you expect it to land on black?</td><td>125</td><td></td><td></td></tr>
<tr><td rowspan="4">3</td><td>Find the probability of an event not happening</td><td>a) The probability that it will not rain tomorrow is 0.95
What is the probability that it will rain tomorrow?

b) A biased 3 sided spinner is used. Complete the probability table.
<table><tr><td>Colour</td><td>Black</td><td>Green</td><td>Purple</td></tr><tr><td>Probability</td><td>0.21</td><td>0.36</td><td></td></tr></table></td><td>125</td><td></td><td></td></tr>
<tr><td>Understand relative frequency as an estimate of probability</td><td>A student tosses a biased coin and writes down his running totals.
Calculate the relative frequencies.
<table><tr><td>throws</td><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td></tr><tr><td>heads</td><td>6</td><td>14</td><td>21</td><td>30</td><td>35</td></tr><tr><td>Relative frequency</td><td></td><td></td><td></td><td></td><td></td></tr></table>Which of your five answers is the best estimate of the probability of landing on heads and why?</td><td>125</td><td></td><td></td></tr>
<tr><td>Calculate probabilities from lists or two-way tables</td><td>A student is chosen at random from the school.
<table><tr><td></td><td>Boys</td><td>Girls</td></tr><tr><td>Lower secondary</td><td>90</td><td>70</td></tr><tr><td>Upper secondary</td><td>60</td><td>80</td></tr></table>Use the table above to find the probability that the student chosen is a girl in upper secondary.</td><td>58; 59; 61</td><td></td><td></td></tr>
<tr><td>Estimate the probability from experimental data</td><td>a) In a week, a driving instructor notes that 20 students pass the exam and 5 students fail. Use this information to estimate the probability that a student passes the driving exam.
b) Complete the table
<table><tr><th>Colour</th><th>Frequency</th><th>Experimental probability</th></tr><tr><td>Red</td><td>7</td><td></td></tr><tr><td>Blue</td><td>4</td><td></td></tr><tr><td>Yellow</td><td>9</td><td></td></tr></table></td><td>125</td><td></td><td></td></tr>
<tr><td rowspan="2">2</td><td>Write down the probability of a single event happening</td><td>A six-sided dice is thrown.
What is the probability of throwing a score of more than 4?</td><td>59</td><td></td><td></td></tr>
<tr><td>Use a list of outcomes to write down the probability of an event happening</td><td>A spinner has five equal sections: Red, Red, Red, Blue, Blue
What is the probability the spinner will land on Blue?</td><td>58</td><td></td><td></td></tr>
</table>

Year 8 – NUMBER – Fractions, decimals, ratio & percentages – Chapter 8

Level	I can...	Example	MW clips	Start of topic	End of topic
6	Use percentages in real-life situations: compound interest, depreciation, percentage profit and loss	Amr invests $3000 for 5 years at a rate of 5% compound interest. How much is in his account at the end?	*164*		
5	Apply repeated percentage changes	Judy puts $400 in her savings account and earns 3% interest in the first year. She then earns 5% interest in the second year. Write down the calculation you would do to work out what is in her account after these 2 years?			
	Find the original amount given the final amount after a percentage change (reverse percentages).	A DVD cost $6.30 after a 30% sale. How much did it cost originally?	*110*		
4	Use percentages in real-life situations: VAT, value of profit or loss, simple interest, income tax calculations.	George invested $500 for 3 years at 5% simple interest. How much interest does he get?	*111*		
	Write ratios in the form 1 : *m* or *m* : 1.	Fill in the gap a) 3 : 9 = 1 : __ b) 136 : 17 = ____ : 1			
	Solve ratio & proportion problems	A coin is made up of zinc and copper in the ratio of 2 : 3. The mass of the coin is 30g. How much copper has been used? What fraction of the coin is zinc?			
3	Use a multiplier to increase or decrease by a percentage.	a)What is the multiplier for increasing by 5%? b) Use a multiplier to decrease $320 by 15%	*109*		
	Use the unitary method to solve percentage problems	20% of a number is 40. Find the original number			
	Use the equivalence of fractions, decimals & percentages to compare proportions.	 Which brand has a higher proportion of protein?	*42*		
	Convert between fractions, decimals and percentages	a) Write (i) 0.8 as a simplified fraction (ii) 22% as a simplified fraction b) Write (i) 0.09 as a percentage (ii) $\frac{1}{5}$ as a percentage c) Write (i) 23% as a fraction (ii) 12% as a decimal	*85*		
	Write one value as a fraction, decimal or percentage of another	a) Write 40 minutes as a fraction of 1 hour b) Write 1h 10 minutes as a decimal number of hours c) What percentage of 1 hour is 15 minutes?	*85*		
	Calculate simple percentage increases and decreases	a) Increase $300 by 10% b) Decrease 400m by 2%	*108*		
	Share a quantity in two or more parts in a given ratio.	a) Share $300 in the ratio of 2 : 3 b) Share 240g in the ratio 1: 2 : 3	*106*		
	Simplify ratios (non-integer values)	a) Simplify 5 : 7.5 b) Simplify $\frac{2}{5}$: 1			
2	Understand the relationship between ratio and proportion	 a) Give the ratio of yellow to purple. b) What proportion is purple (give your answer as a percentage)? c) How are ratio & proportion different? How are they the same?	*42*		
	Simplify ratios (integer values)	a) Simplify 12 : 40 b) Simplify 35mins : 1 hour	*38*		
	Write and understand simple ratios	There are 12 girls and 17 boys in a class. Write the ratio of boys to girls.	*38*		

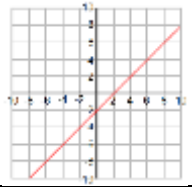
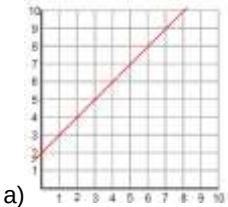
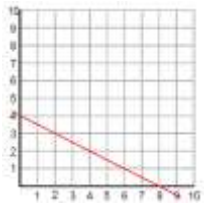
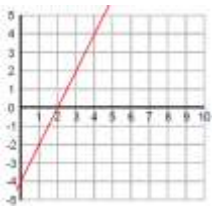
Year 8 – GEOMETRY – Angles & shapes – Chapter 9

Level	I can...	Example	MW clips	Start of topic	End of topic
6	Solve angle problems by constructing and solving equations.	---			
5	Solve two-or-more-step angle problems by finding interior or exterior angles in regular polygons.	---			
4	Find the size of each interior angle or the size of each exterior angle or the number of sides of a regular polygon.	1) What is the size of 1 interior angle of a regular octagon? 2) A regular polygon has each exterior angle as 36°. How many sides does it have?	*123*		
	Find missing angles in polygons	  1) What is the sum of the interior angles of the shape in yellow? 2) Find angle 'a' 3) A hexagon has five of its exterior angles totalling 276°. What is the size of the sixth angle?			
3	Find the sum of the interior angles in a polygon		*123*		
	Know the sum of exterior angles in a polygon is 360°		*123*		
	Solve harder problems using properties of angles, of parallel and intersecting lines, and of triangles and other polygons, by looking at several shapes together.	 Find all the missing angles and give reasons	*45; 120; 121; 122*		
	Calculate angles in parallel lines (alternate, corresponding & co-interior angles)		*120*		
	Recognise and use vertically opposite angles.	1) Which angles are vertically opposite? 2) Find a°, b°, c°, d° and give reasons	*45*		
	Classify quadrilaterals by their geometrical properties	Explain a) what is the same and b) what is the difference between a square and a rhombus			
2	Identify and begin to use angle, side and symmetry properties of quadrilaterals.	Identify the shape being described. "I have one pair of equal angles and no parallel sides"			

Year 8 – STATISTICS – Charts – Chapter 10

Level	I can...	Example	MW clips	Start of topic	End of topic
4	Compare two sets of data using statistics or the shape of the graph	*page 230 q1, 2; page 231 q4; page 232 q6*			
	Interpret a stem-and-leaf diagram	*page 225 q5, 6*			
	Find the median, mode and range from a stem and leaf diagram.	*page 225 q4*			
	Draw a line of best fit 'by eye' and use this to make predictions	*page 235 q5, 6*	*129*		
3	Recognise when it is appropriate to use mean, median or mode	*page 222 q4*			
	Produce an ordered back-to-back stem and leaf diagrams.	----	*128*		
	Produce an ordered stem-and-leaf diagram	*page 225 q3*	*128*		
	Plot a scatter diagram and describe correlation as strong/weak, positive/negative	*page 233 to page 235*	*129*		
	Design and complete a grouped frequency table for discrete and continuous data	*page 223 q8, 9*			
	Design a two-way table	----	*61*		
	Find mean average and range from a frequency table	*page 222 q2, 3, 4*	*130*		
2	Draw a pie chart for categorical data or discrete/continuous numerical data	*page 228 q4, 5; page 229 q6*	*65; 128*		
	Complete and interpret information in two-way tables	*page 222 q5, 6*	*61*		
	Calculate the mean, median, mode and range for discrete data.	*page 221 fluency*	*62*		
	Interpret and draw line graphs.	*page 230 q2; page 231 q5*	*65*		

Year 8 – ALGEBRA – Graphs – Chapter 11

Level	I can...	Example	MW clips	Start of topic	End of topic
5	Find the equation of a line from a graph in the y = mx + c form	Find the equation of this line 	*159*		
	Draw straight line graphs from equation using the gradient-intercept method	What is the y-intercept of the line y = 3x - 1? What is the gradient of the line y=3x - 1? Use the y-intercept and gradient to draw the graph of y = 3x - 1	--		
4	Plot straight lines of form ay±bx=c	Plot the graph of 3x - y = 2 on a coordinate grid (*Hint: x = 0 then y = 0)*	--		
	Find the y-intercept value and gradient from a line's equation in the form $y = mx + c$	Without drawing the line, state the gradient and the y-intercept value of the line $y = 2x + 5$	--		
3	Use and understand line graphs for real life problems	*see page 253 q8 & 9 and page 255 q10*	--		
	Check if a points lies on a line	Does (3, 11) or (5, 15) lie on the line y = 2x + 5? Show your working	--		
	Find the gradient (slope) of a given line by using $gradient = \frac{increase\ in\ y}{increase\ in\ x}$	Find the gradients of these lines  a)  b)  c)	*97*		
	Plot straight lines of form y=mx + c using a table of values	Draw coordinate axes using values of -8 to 8 on each axis Draw and label the lines $y = 5$, $y = x + 2$, $y = 6 - x$	*96*		