

Independent Study – How do I revise maths?

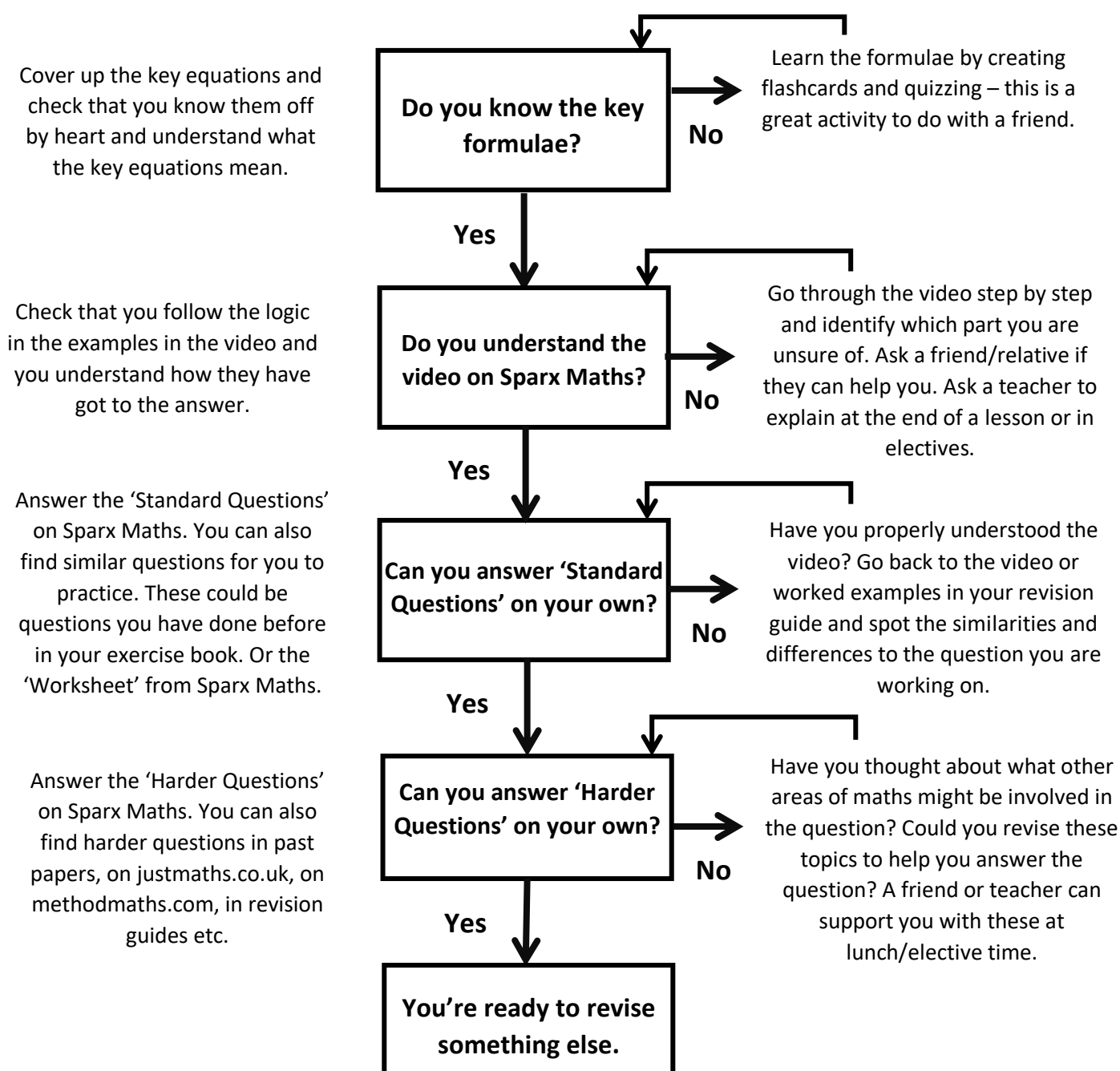
Here are some top tips to ensure that your maths revision is effective as possible.

Step 1: Decide what topic(s) you want to revise.

It's important to pick a topic which will help you get better (not something you already know)

- Pick topics which you need to work on from previous mocks or the attached checklists.
- Look at the topics to revise for the next mock (shared on epraise).
- If in doubt, flick through the topics in your revision guide, topic booklets & Sparx Maths.

Step 2: Follow the flow chart below to check your understanding of the topic.



Don't forget to practice answering past paper questions!

You can access papers at past paper Friday.

Foundation Checklist – Ratio, Proportion and Rates of Change

RAG	Sparx	Description of skill	Example(s) of question.		
	U519 U134	Using scale factors, diagram and maps	The map has a scale of 1:2000. Find the distance between A and B in real life.		
	U881 U916	Working with fractions.	In a class of 30 pupils, 6 are blonde. What fraction of the class is not blonde, in its simplest form? Find $\frac{3}{5}$ of £240.		
	U577	Sharing in a ratio	Share £35 in the ratio 3 : 4	Share £200 in the ratio 1 : 2 : 5	
	U676	Ratio problems	Anne and Ben share money in the ratio 3 : 5. If Anne gets £21, how much does Ben get? If Ben gets £9 more than Anne, how much does Ben get?		
	U773 U671 U286	Percentage change	Increase £40 by 5%.	Decrease £40 by 2.5%.	A jumper is £24 in a 20% off sale. How much was it before?
	U278	Express one quantity as a percentage of another	I buy a car for £3000. I sell it for £3200. What is the percentage profit?		
	U594 U888	Compare / order fractions, decimals and percentages.	Write these in ascending order: $\frac{3}{4}$, 0.8, $\frac{7}{10}$, 71%, $\frac{36}{50}$		
	U533	Simple Interest	I invest £6000 in a bank account with an interest rate of 2% simple interest per year. How much money do I have after 3 years?		
	U332	Compound interest	I invest £6000 in a bank account with an interest rate of 2% compound interest per year. How much money do I have after 3 years?		
	U610	Exchange rates	The exchange rate for pounds to Euros is £1 = €1.14 I convert £300 to euros, how many euros do I get? I convert €300 to pounds, how many pounds do I get?		
	U914 U193 U277	Interpreting distance time graphs and other real-life graphs	<p>The graph shows a straight line starting at (0, 4) and passing through (2, 8), (4, 12), (6, 16), and (8, 20). The y-axis is labeled 'Volume (L litres)' and the x-axis is labeled 'Time (t seconds)'.</p>		<p>This graph shows the amount of liquid in a container over time.</p> <p>What does the y-intercept represent?</p> <p>What does the gradient represent?</p>

Foundation Checklist – Number

RAG	Sparx	Description of skill	Example(s) of question.	
	U600 U435	Place value	What is the value of 7 in 3.274? Write the number three million in figures.	
	U600 U435	Ordering numbers	Put these integers in ascending order: 3, 5, -2, 0, -1, 2 Put these decimals in order: 0.3, 0.32, 0.032, 0.03	
	U735 U127 U293	Multiplying integers and decimals	Multiply 38×7	Multiply 3.8×7.2
	U735 U453 U868	Dividing integers and decimals	Calculate $2742 \div 3$ Calculate $245 \div 6$ (give your answer as a decimal)	
	U417 U478	Add and subtract integers and decimals	Calculate $12 - 35$	Calculate $37.4 + 127$
	U497	Using standard units	Give the correct units for the calculation.	
	U236	Prime numbers	List the prime numbers between 20 and 30. Which of these are prime numbers: 7, 9, 11, 13, 15	
	N/A	Listing strategies	A menu has three starters and four mains. List all the possible combinations of mains and starters.	
	U888	Decimals and fractions	Convert $\frac{3}{5}$ to a decimal.	Convert 0.35 to a fraction.
	U330 U534	Standard form	Write 3500000 in standard form. Write 0.000000024 in standard form. Write 3.6×10^4 as a normal number.	
	U480 U298 U731 U965	Rounding	Round 7653 to the nearest 100. Round 3.696 to 2 decimal places. Round 0.000436 to 1 significant figure.	
	U851 U235 U694	Powers	What is 2 to the power of 3? Write $7 \times 7 \times 7 \times 7 \times 7$ in index form. Which of these numbers is a power of 3: 6, 12, 18, 27?	

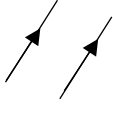

	U976	Order of Operations	Calculate $2 + 7 \times 5$ Add brackets to make this true: $10 - 2 \times 3 = 24$		
	U976	Operations with negative numbers	Calculate 3×-6	Calculate $-24 \div -3$	Calculate $4 + -6$
	U475 U544	Multiplying and dividing fractions	Calculate $\frac{2}{3} \times \frac{3}{5}$		Calculate $2\frac{1}{2} \div \frac{4}{5}$
	U211 U739	Multiples and factors	Write down the first five multiples of 6. Write down the factors of 30. Write 45 as a product of prime factors.		
	U751 U529 U250	LCM and HCF	Find the HCF and LCM of 24 and 30. Find the HCF and LCM of $A = 2 \times 3^2 \times 5$ and $B = 2^3 \times 5^2$		
	U926	Interpret calculator displays	Calculate the following and write down all the decimals on your calculator display: $\frac{\sqrt{3.4} \times 6}{5.2^3}$		
	U176	Fractions and ratios	The ratio of cats to dogs is 3:2. What fraction are cats? $\frac{3}{7}$ of pets are cats. What is the ratio of cats to not cats?		
	U888	Fractions and percentages	Convert $\frac{2}{5}$ to a percentage. Convert 32% to a fraction in its simplest form.		
	U225	Estimation	Estimate 2.3×52	Estimate $\frac{21.3 \times 7.4}{4.96}$	
	U388 U248 U468 U663	Converting metric units	Convert 300g to kilograms. Convert 1420ml to Litres. Convert 4.3km to m.		
	U151 U265	Compound measures	A car travels at 30mph for 5 hours. How far does it travel? A car travels 30 miles in 5 hours. How fast does it travel?		
	U736	Adding and subtracting fractions	Calculate $\frac{2}{3} + \frac{3}{5}$		Calculate $2\frac{1}{2} - \frac{4}{5}$
	U851 U235 U694	Index laws and negative indices	Simplify $3^6 \times 3^7$	Simplify 5^{-2}	Simplify $(5ab^3)^2$
	U657 U301	Error intervals	A = 2.3 to 1 decimal place. Write an error interval for A. B is 27.4 truncated to 1d.p. Write an error interval for B.		

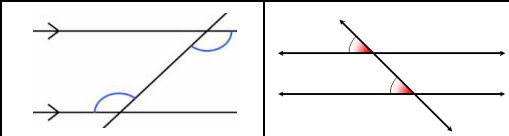
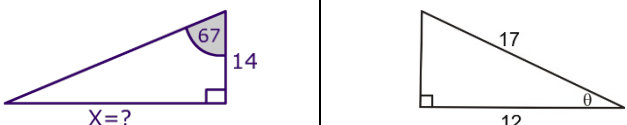
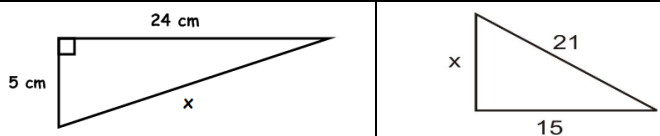
Foundation Checklist – Algebra

RAG	Sparx	Description of skill	Example(s) of question.		
	U213	Sequences and rules	What is the next term in this sequence? 3, 8, 13, 18, ... What would the 10 th number in this sequence be? What is the term to term rule of the sequence?		
	U680	Sequences of square, triangular and cube numbers	What is the next number in this sequence : 1, 4, 9, 16, ... What is the next number in this sequence : 1, 3, 6, 10, ... What is the next number in this sequence : 1, 8, 27, 64, ...		
	U741	Plotting straight line graphs	Draw the graph for $y = 3x - 2$	Draw the graph for $y = 5 - 2x$	
	U789	Coordinates in four quadrants	Find the coordinates of point A. Draw cross at the point (-3,5). What is the midpoint (2,3) and (-6, 7) ?		
	U585	Substitution	$P = 2a - 3b$. What is the value of P if $a = 6$ and $b = -4$? $v = u + at$. Find a if $v = 30$, $u = 10$ and $t = 5$		
	U775	Function machines		What is the output when the input is 8? What is the input when the output is 22?	
	U498	n th term of linear sequences	Find the n th term of this sequence: 3, 7, 11, 15, ... The n th term is $4n - 5$, what is the 20 th term? Is 108 in the sequence with n th term $4n + 1$?		
	U179	Expanding single brackets	Expand $3(2x - 5)$	Expand $3y(2y + 4)$	Expand and simplify $3(z + 2) + 2(z - 4)$
	U325	Solving equations with one unknown	Solve $4x + 3 = 7$	Solve $\frac{3x+4}{2} = 3.5$	
	U315	Finding the equation of a line	What is the gradient of this straight-line graph? What is the y-intercept of this straight-line graph? What is the equation of this straight-line graph?		
	U437	Factorising single brackets	Factorise $6a + 15$	Fully factorise $14x - 21x^2$	
	U105	Simplifying expressions	Simplify $\frac{a \times a \times b}{a \times b \times b}$	Simplify $b^3 + b^3$	Simplify $3c \times 7d$

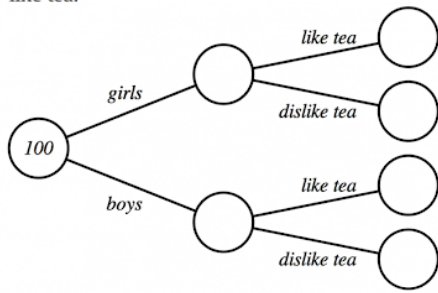
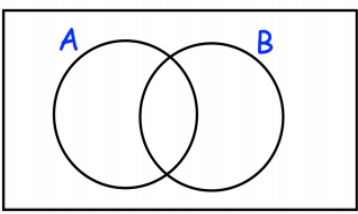
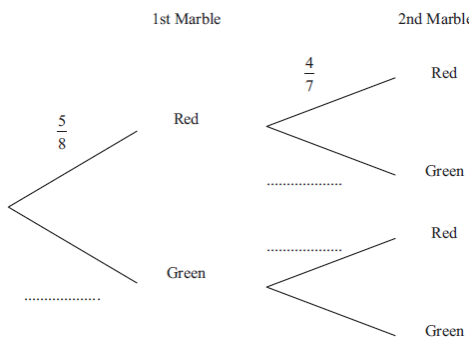
	U105	Collecting like terms	Simplify fully $3x + 3y - x - 7y$	Expand and simplify $3(2x + 1) - 2(x - 3)$														
	U556	Changing the subject	Make a the subject: $b = 2a - 1$	Make c the subject $d = \frac{3c+b}{a}$														
	N/A	Writing formulae and expressions	There are 7 boats with y people on each boat. Write an expression in terms of y for the total number of people.															
	U759 U738	Solve linear inequalities in one variable	Solve this inequality $-3 < 2x + 5 \leq 7$ Solve this inequality and draw on a number line: $2x - 1 < 8$															
	U338	(Simplify surds)	Simplify fully: $2\sqrt{3} + 5 + 4\sqrt{3} + 2$															
	U235 U694	Simplify Indices	Simplify $a^6 \times a^{-2}$	Simplify $\frac{a^6 \times a^3}{a}$	Simplify $(3ab^3)^2$													
	U989	Plot quadratic graphs	Complete the table and sketch the graph $y = x^2 + 2x - 3$	<table border="1"> <tr> <td>X</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>Y</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	X	-2	-1	0	1	2	3	Y						
X	-2	-1	0	1	2	3												
Y																		
	U667	Graphical solutions to equations	Use the graphs to find the roots of the equation $y = x^2 + 2x - 3$ to 1 decimal place. Use the graph to find the coordinate of the turning point.															
	U680	Fibonacci-like sequences	Find the next two terms in this Fibonacci seq: a, 3a, 4a, ... What is the 8 th term in this Fibonacci seq: 3, 5, 8, 13, ...															
	U206 U958	Quadratic and geometric sequences	The n th term of a sequence is $3n^2 - 4$. Find the 8 th term. The n th term of a sequence is 3×2^n . Find the 5 th term.															
	U768	Expand double brackets	Expand $(x + 4)(x - 3)$ Expand $(x + 3)^2$															
	U178 U858	Factorise quadratics	Factorise $x^2 + 5x + 6$ Factorise $x^2 - 9$ Solve by factorising $x^2 + 6x - 16 = 0$															
	U980 U593	Cubic and reciprocal graphs	Which of the following graphs is reciprocal? Which of the following could have equation $y = x^3$ Complete the table and plot the graph $y = 4/x$															
	U173 U760 U757	Solve linear simultaneous equations	Solve these simultaneous equations: $2x + 3y = 16$ $3x - 6y = 3$															

Foundation Checklist – Geometry and Measures

RAG	Sparx	Description of skill	Example(s) of question.				
	U598 U196 U632	Translations and vectors	Translate the shape by vector $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$ Describe the transformation that maps shape A to B.				
	U121	Properties of triangles and quadrilaterals	Find the missing angle of a triangles (including isosceles and equilateral) and quadrilaterals (including special quadrilaterals).				
	U447	Measuring / drawing lines and angles	Measure the length of this line. Measure the size of angle x.				
	U730 U628 U732 U329	Understand geometrical terminology & diagrams	Angle ABC	\widehat{ABC}	$\sphericalangle ABC$		
	U790 U886	Identify congruent shapes (know congruency rules)	Which of the following shapes are congruent? (Explain why these two triangles are congruent).				
	U551 U112 U578	Identify similar shapes and use to find missing sides.	Which of these shapes are similar? Shape A and B are similar – find the missing length PQ.				
	U121 U761 U719	Naming and drawing 2-D and 3-D Shapes	Draw a sketch of a cylinder. Draw a sketch of a triangular prism. Draw a sketch of a square based pyramid.				
	U174	Volume of prisms	Find the volume of this prism. Find the volume of a cylinder.				
	U903 U564	Vector arithmetic	$\mathbf{a} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}, \mathbf{b} = \begin{pmatrix} 4 \\ -3 \end{pmatrix}$ Find $\mathbf{a} - 2\mathbf{b}$				
	U781	Solve geometrical problems	A, B and C are three corners of a square. What are the coordinates of the fourth corner?				
	U427	Interior and exterior angles of polygons	Find the missing angle in the octagon. What are the interior angles of a regular pentagon? What are the exterior angles of a regular hexagon?				
	U967 U743	Plans and elevations	Draw the plan and elevation of this 3D shape. Using the plan and elevations, sketch the 3D shape.				
	U351	Perimeter of 2D shapes	Find the perimeter of this compound shape.				

	U519 U134	Enlargements (including fractional and negative scale factor)	Enlarge the shape by scale factor 1.5 from centre (0,0). Describe the transformation that maps shape A to B.
	U604	Circle circumference	Find the circumference of the circle from the given radius or diameter.
	U767	Circle terminology	Identify and use the terms: centre, radius, diameter, tangent, circumference, chord, arc, segment, sector.
	U164 U107 U525	Bearings	What is the bearing of Ship B from Ship A. A ship travels 10miles at a bearing of 075. Draw a cross to show the final position of the ship on the map.
	U993 U970 U945 U424 U265	Areas of triangles, parallelograms, trapezia and compound shapes	Draw a triangle with the same area as this trapezium. The area of this trapezium is 30cm^2 , find the height h.
	U696 U799	Rotation and reflection	Reflect this shape in the line $y = x$. Rotate this shape by 90° clockwise around point (0,1). Describe the transformation that maps shape A to B.
	U950	Areas of circles	Find the area of the circle to 1d.p. given the radius or diameter.
	U730 U826	Vertically opposite, alternate & corresponding angles	Give a reason why the angles are equal. 
	U283 U545	Trigonometric ratios to find missing sides and angles.	
	U929 U259 U871 U464 U523	Surface area of 3D shapes	Find the surface area of cuboids and prisms. Find the surface area of cylinders.
	U245	Standard constructions	Construct a perpendicular bisector. Construct a perpendicular line through a point. Bisect the given angle.
	U385	Find missing sides of using Pythagoras.	
	U820	Draw loci using a ruler and compass.	Shade the region that is more than 3m from corner A and less than 2 metres from wall AB.
	U221	Arc lengths and areas of sectors.	Find the area and arc length of this sector.

Foundation Checklist – Probability

RAG	Sparx	Description of skill	Example(s) of questions
	U803	Probability scales	Place events on a probability scale (0 - 1) as fractions, decimals or percentages.
	U104	Probability of equally likely outcomes	A dice is rolled two times. Draw a sample space diagram to show all the possible combinations of outcomes.
	U280	Frequency trees	<p>1) 100 students are asked if they like tea. 45 of these students are boys. 28 girls like tea. 19 boys dislike tea. Complete the frequency tree.</p> 
	U476 U748	Venn diagrams	<p>$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16\}$</p> <p>A = multiples of 3 B = multiples of 5</p> <p>(a) Complete the Venn diagram</p> <p>One of the numbers is selected at random.</p> <p>(b) Write down $P(A \cap B)$</p> 
	U580	Theoretical and experimental probability	The probability of rolling a six on a biased dice is 0.2. How many sixes would you expect to get in 400 rolls?
	U981	Complete and use two-way tables	<p>49 of the 100 students are girls. 10 of the girls came by car. 16 boys walked. 21 of the 41 students who came by bicycle are boys.</p> <p>Work out the total number of students who walked to school.</p>
	U280	Probability trees for independent and dependent events	<p>1st Marble 2nd Marble</p>  <p>Work out the probability that Dwayne takes marbles of different colours.</p>

Foundation Checklist – Statistics

RAG	Sparx	Description of skill	Example(s) of question.
	U200 U909	Stem and leaf diagrams	Draw a stem and leaf diagram to show this information. Calculate the median/mode/range from a stem and leaf diagram.
	U322	Types of data	Be able to recognise continuous, discrete and grouped data.
	U508 U172	Draw and interpret (simple percentages & fractions) pie charts	Draw a pie chart to show this information. How many students chose option A?
	U363 U557 U506 U569 U981 U312	Draw and interpret bar charts, pictograms and frequency tables.	What is the total frequency? What is the modal class interval? Estimate the mean.
	U403	Time series	Draw a time series graph to show this information.
	U162	Sampling and population	Explain how a sample may/may not be representative of the entire population.
	U717	Averages (+ advantages and disadvantages)	Calculate the mode, median, range and mean of a set of numbers. (What are the advantages/disadvantages of these averages?)
	U277	Correlation	What type of correlation does the graph show?
	U840	Frequency polygons	Draw a frequency polygon to represent this data. Use this frequency polygon to estimate the mean.
	U507 U520	Comparing data and distributions with graphs and charts	Draw a back to back stem and leaf diagram. Draw a dual/composite bar chart.
	U277 U128	Use and interpret scatter graphs. (Inter/extra-polation)	Identify outliers. Draw a line of best fit – use this line of best fit to estimate a value on the graph.