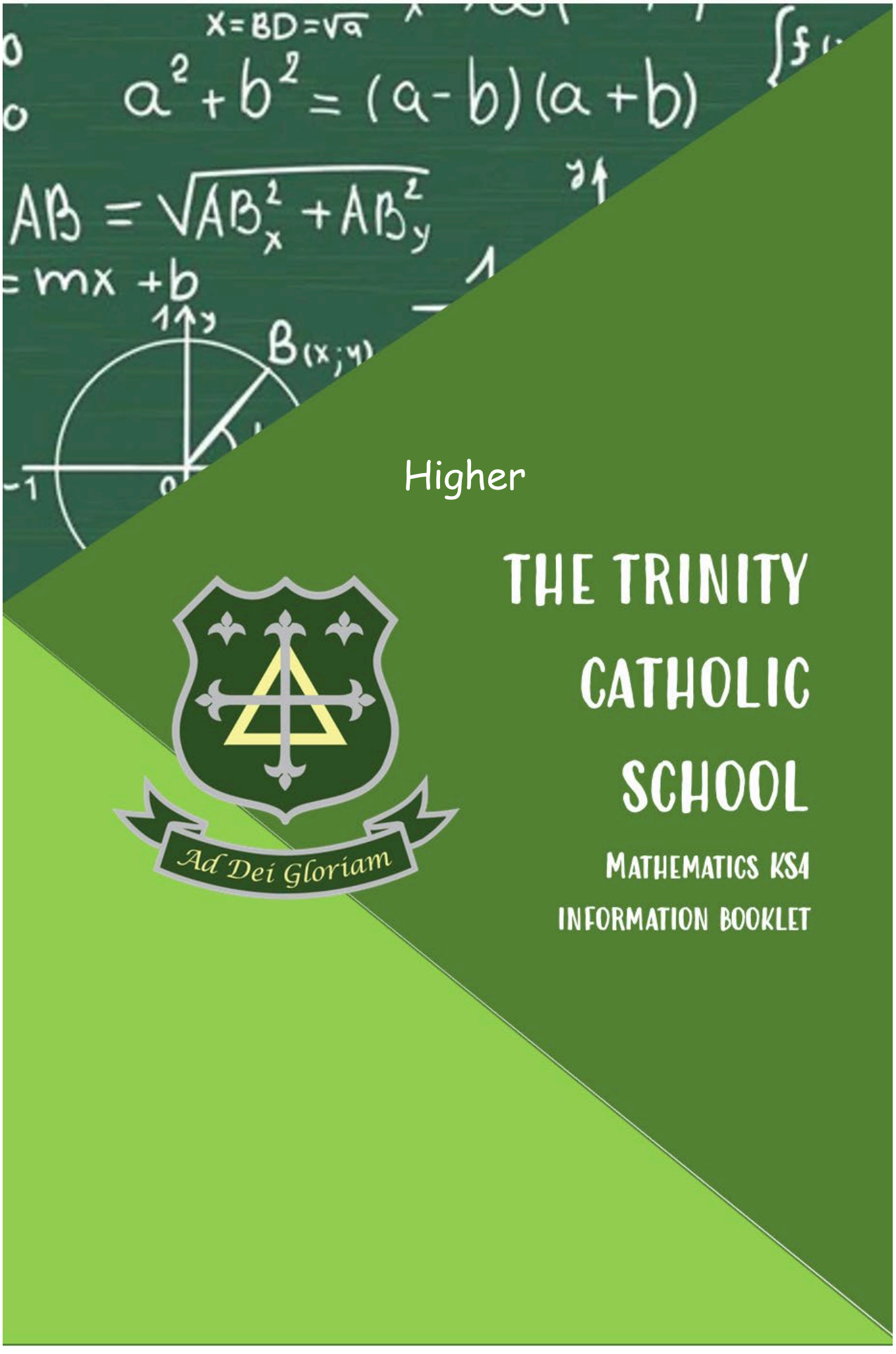


Higher

THE TRINITY CATHOLIC SCHOOL

MATHEMATICS KS4

INFORMATION BOOKLET

Curriculum Information

Key Stage 4
Subject: Maths Higher
Head of Department: Mrs Butler

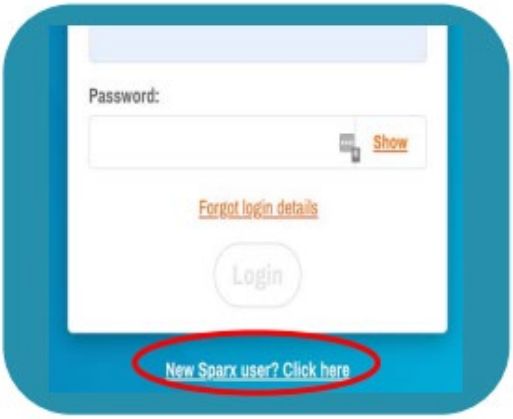
Which exam will students sit?	At Trinity we teach the Edexcel 9 – 1 GCSE Mathematics specification. Students will sit the Edexcel GCSE Mathematics examination.
What are the key topics and when will they be taught?	There are five main strands of Maths: Number, Algebra, Geometry & Measure, Probability & Statistics and Ratio & Proportion.
How are students assessed?	There will be 3 papers, each making up a third of the grade awarded. There will be 2 calculator papers and 1 non-calculator paper, each paper is 1 hour 30 minutes long. Dates for these papers will be released nearer the time.
What resources are available to us?	Students will be receiving past papers regularly in school next year. However, here are some places you can go now: • www.edexcel.com Here you will find the full specification and sample papers. • www.sparx.co.uk This is the website students use for homework, there is more information on the best way to use Sparx later in this document. • www.justmaths.co.uk Lots of questions from past papers. • www.getrevising.co.uk Thousands of resources including quizzes and questions. • www.corbettmaths.com 5-a-Day question are great for key skills in maths at every level. There are worksheets, answers and video clips to target specific skills too. • www.diagnostic questions.com Requires you to sign up but it is free. Huge range of mini quizzes which are designed to bring out common misconceptions. • www.mathsgenie.com Lots of revision resources here to suit everyone.

Homework

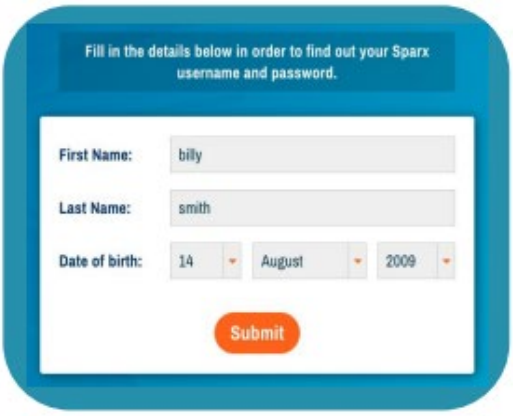
We set homework on www.sparx.com
You can use Sparx on PCs, laptops, tablets and phones. If you have any problems then your child can complete the homework at school (more information about this later).

Here is a step-by-step guide to getting started:

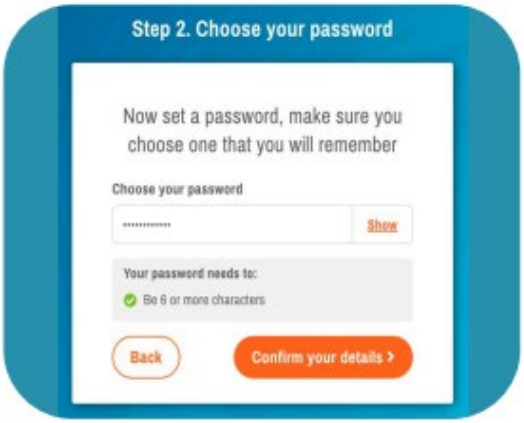
1. Go to sparx.co.uk and click **Log in**



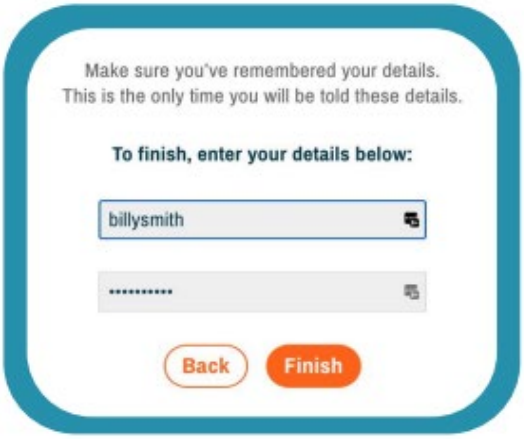
2. Select **Student Login**
3. Carefully select your school from the list
4. Select **New Sparx user**



5. Enter your:
   - First Name
   - Last Name
   - Date of Birth
6. Click **Submit**
7. You will be prompted to set your own password. The password must be at least 6 characters long and you will need to remember it



8. Confirm your username and password, and click **Finish**
9. You can now log in to Sparx using your username and password

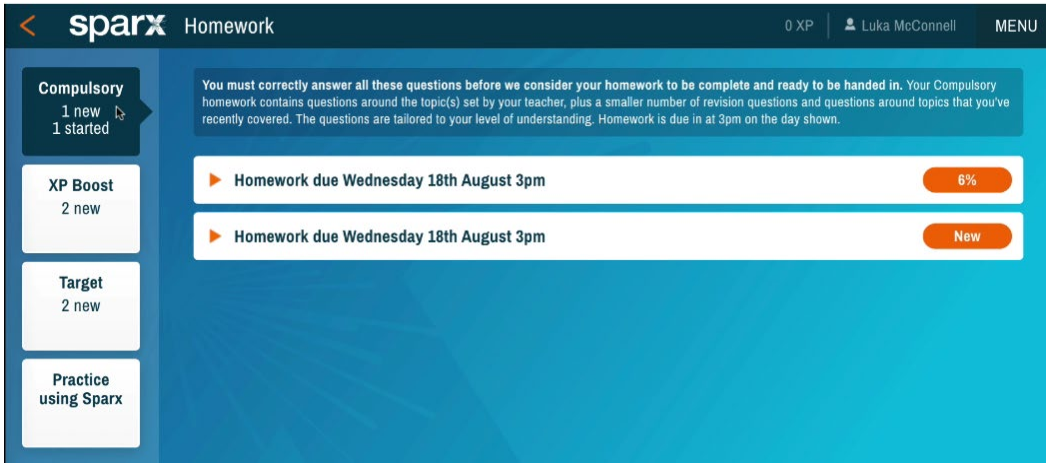


10. If a password is lost, you can select the option to request a new password from your teacher

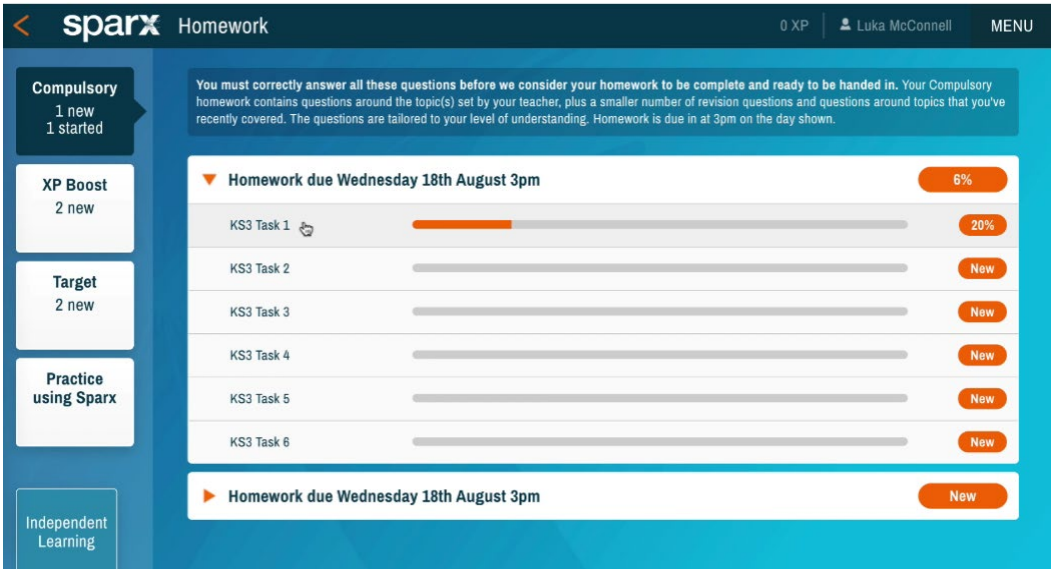
Create a password and write it in the box below as well as school planner.

A password reset can be requested via the website.

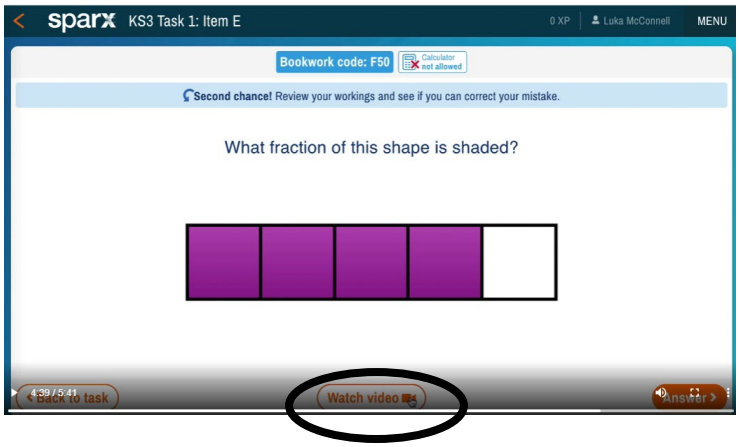
The logon screen will display homework tasks:



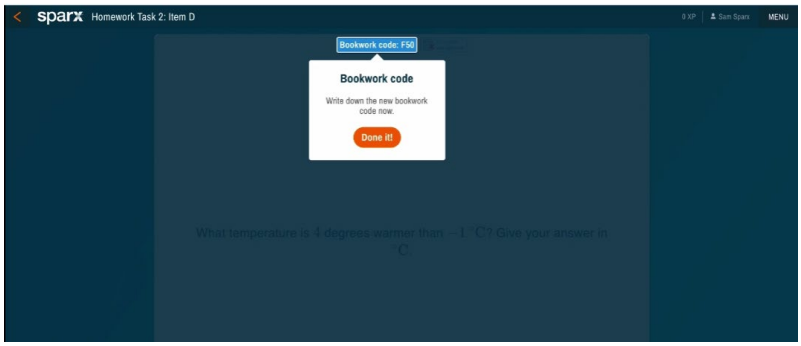
Complete the compulsory homework first. There will be several tasks which have been set at a specific level.



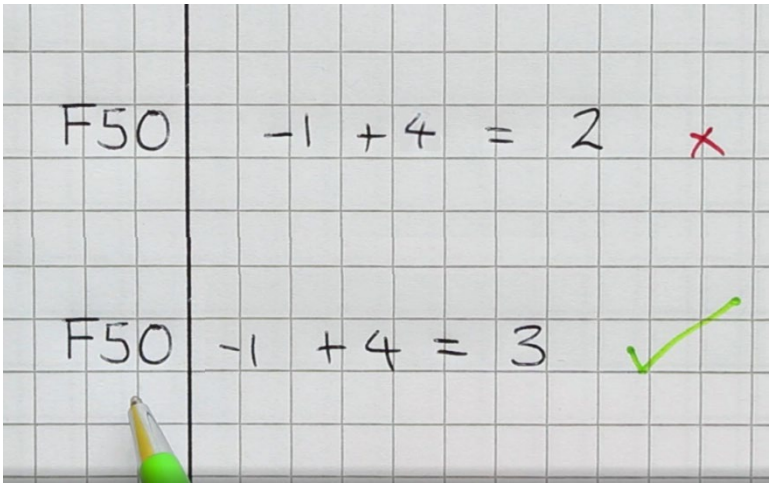
Students must achieve 100% on all tasks. Students can watch a video via a link at the bottom of the question and try again if they get a question incorrect. XP points are earned for every set of questions answers in Sparx.



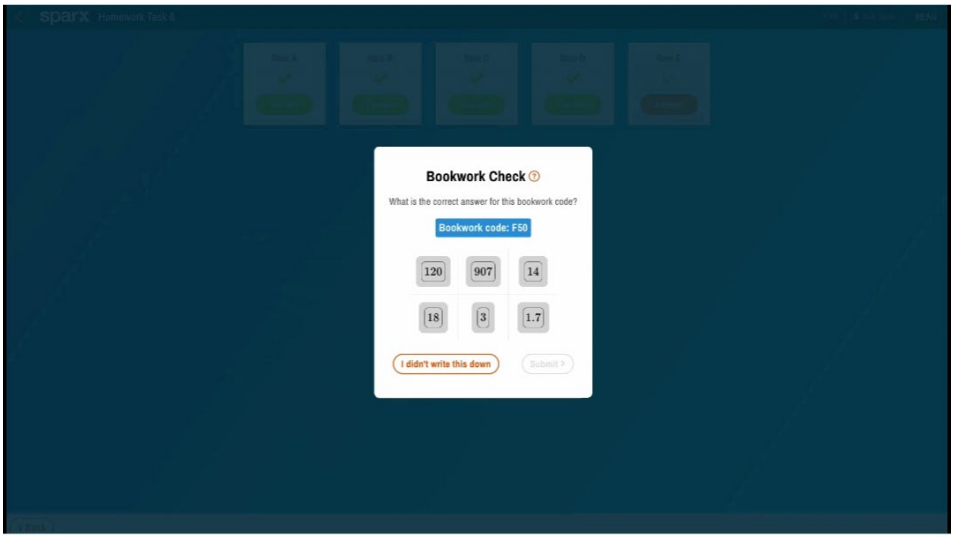
For every single question completed in Sparx students need to write down their answer and working out in a book for a bookwork check. For each question there will be a bookwork code at the top of the screen.



Students should write down the code before they start the question. If they get the answer wrong they should try it again with the same bookwork code and mark their work as they go.



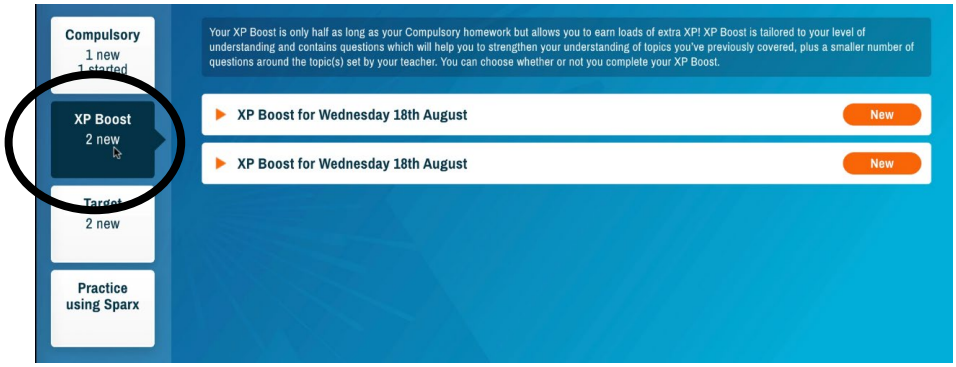
Every so often, students will have a bookwork check where they need to give a code.



Teachers can see how long students spend doing the quiz and how much of the video students have watched. Teachers will also see how many times students have done the quiz, which questions they got right and wrong, which answers they put and the time spent on each one and the date and time of when they did it.

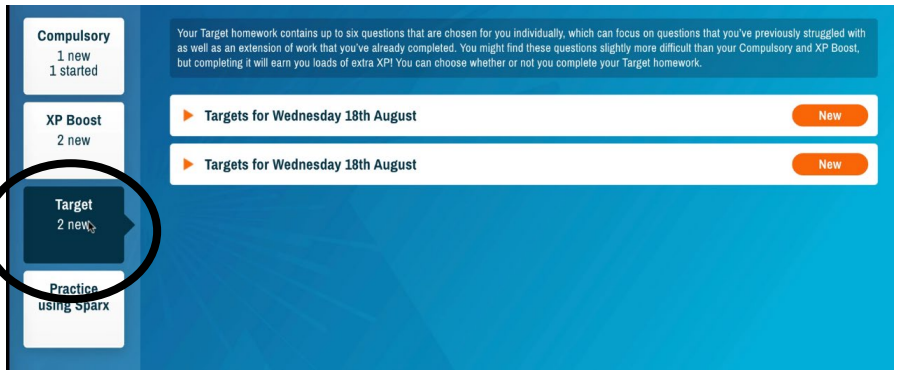
Want to do extra?

XP Boost



XP Boost questions are at a similar level to the compulsory homework questions and will be rewards with extra XP points.

Target

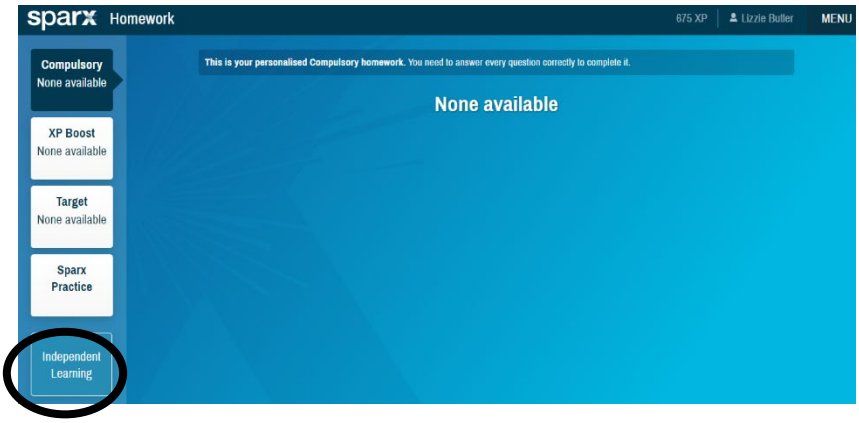


These are designed to give your child a bit of a challenge and will also earn XP points.

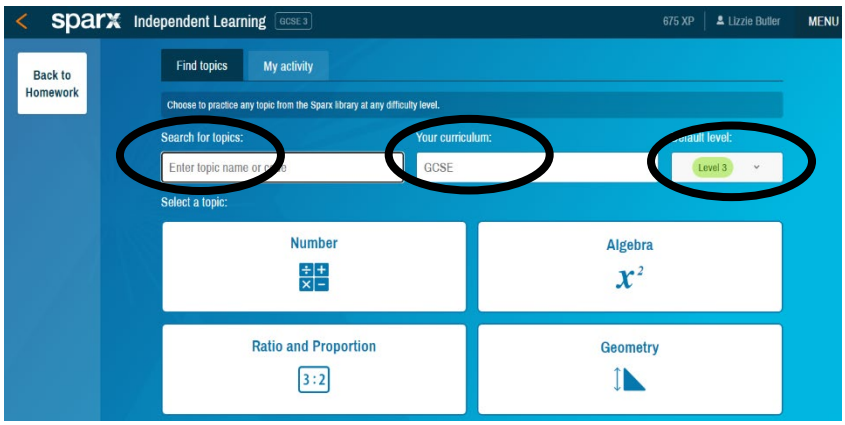
The absolute best way to learn any topic is to do a little bit very often. Do one XP Boost and Target tasks each week and you will master maths.

Want to search for a topic or Sparx clip number?

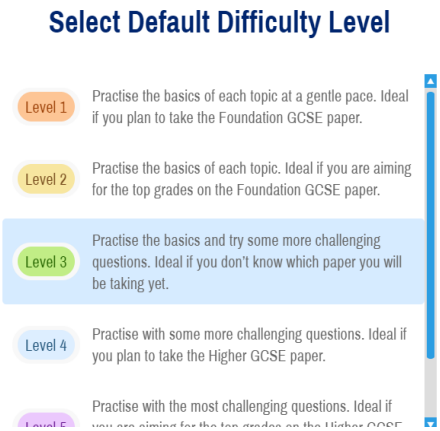
You can search for a topic or clip number to help you revise for your Maths assessments. Click on Independent Learning on the bottom left of the home screen.



In the 'Search for topics' type wither the topic name or Sparx code you want to revise. You must select 'GCSE'. Then click the level of difficulty choosing from 1 being the easiest to 4 being the most challenging.



Here are the difficulty levels:



How to revise for GCSE Maths

The best way to revise Maths is to do Maths by practising questions.

- You need to make sure you are revising the right topics for your target grade.
- You should prioritise topics you find hard or can't do.
- Then when you get stuck you need to take action and find some help.

There are lots of ways you can do this:

Sparx.co.uk

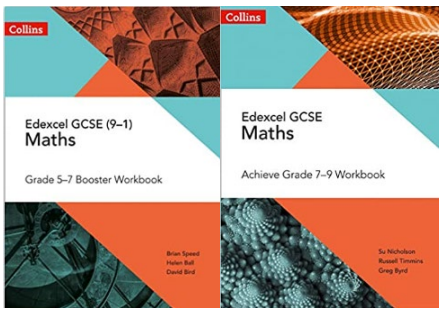
Watch videos when you get stuck and make notes from the video for attempting the task.

XP Boost - This function uses topics you have done in the past and revisits them at meaningful intervals.

Target – This function randomly selects questions which are more challenging than the questions you have been set for homework and so this will develop your Maths even further.

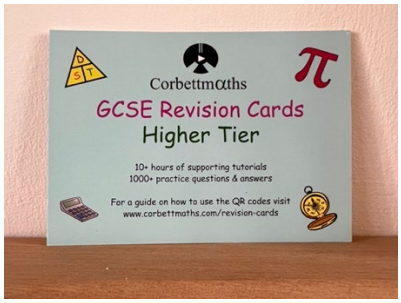
Revision guides/workbooks

These can be purchased from any Maths teacher for £5.00. Do the questions in your revision guide. Check the answers in the back after you have done the questions. Revise any topics you are getting stuck on using Sparx. Be sure to purchase the book which focuses on the grade you are aiming for.



Revision cards

These can be purchased from any Maths teacher for £7.00. Use these to practice questions, learn important concepts and test yourself. Use the QR code to find answers, extra worksheets, exam questions and video for each card.



CorbettMaths.com

Do the 5 a day questions every day. Choose the right grade for you. There are also videos, exam questions and worksheets on every topic in GCSE. Use these for more topic revision.

Learning formulae

You will be given a formula sheet in the exam which is below. You don't need to learn these formulae but you should practice knowing when and how to use them.

Higher Tier Formulae Sheet

Perimeter, area and volume

Where a and b are the lengths of the parallel sides and h is their perpendicular separation:

Area of a trapezium $= \frac{1}{2}(a+b)h$

Volume of a prism = area of cross section × length

Where r is the radius and d is the diameter:

Circumference of a circle $= 2\pi r = \pi d$

Area of a circle $= \pi r^2$

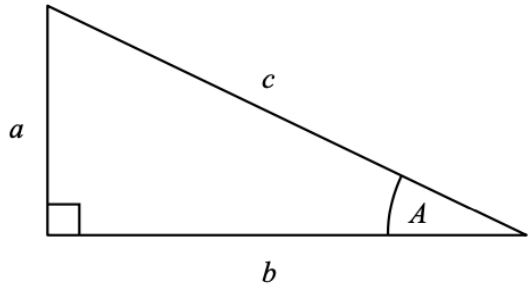
Quadratic formula

The solution of $ax^2 + bx + c = 0$

where $a \neq 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Pythagoras' Theorem and Trigonometry

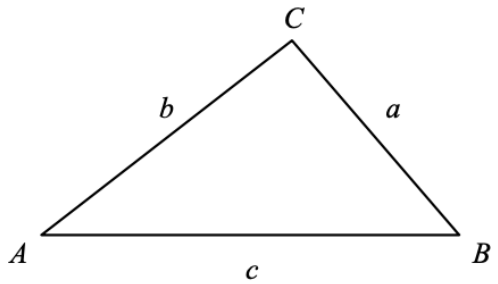


In any right-angled triangle where a, b and c are the length of the sides and c is the hypotenuse:

$a^2 + b^2 = c^2$

In any right-angled triangle ABC where a, b and c are the length of the sides and c is the hypotenuse:

$$\sin A = \frac{a}{c} \quad \cos A = \frac{b}{c} \quad \tan A = \frac{a}{b}$$



In any triangle ABC where a, b and c are the length of the sides:

sine rule: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

cosine rule: $a^2 = b^2 + c^2 - 2bc\cos A$

Area of triangle $= \frac{1}{2}ab\sin C$

Compound Interest

Where P is the principal amount, r is the interest rate over a given period and n is number of times that the interest is compounded:

Total accrued $= P\left(1 + \frac{r}{100}\right)^n$

Probability

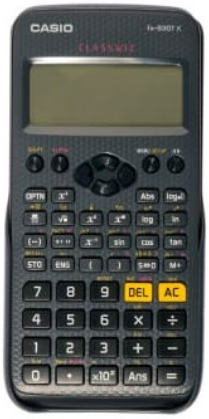
Where P (A) is the probability of outcome A and P (B) is the probability of outcome B:

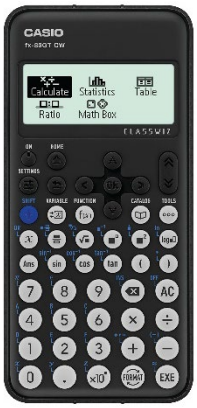
P (A or B) = P (A) + P (B) – P (A and B)

P (A and B) = P (A given B) P(B)

Practice with the correct calculator

It is extremely important that students have the correct scientific calculator, these can be purchased from most supermarkets, but you can buy them from any Maths teacher. The model that your child should have is the Casio fx-83GTX or Casio fx-83GTCW.





Past papers

We will begin working through past papers in lessons and for homework, but students can try them now. The more effort students put into completing these, the more improvement there will be. Students will get used to seeing different types of questions and how topics arise in exam situations.

Get support

Students can contact their teacher to ask a question either by email.

The best way to get support is to come to Maths Club. Everyone is welcome to join the teachers on Tuesdays and Wednesdays in MA8 from 12.30 - 1.00pm. Students can bring along some work, a past paper or book from lessons and spend more time on tricky skills.

Students need to begin doing at least 30 minutes work on your maths 2 or 3 times a week for now. By next year, students need to begin doing at least 30 minutes work on your maths every day.

Sparx Clip Catalogue

This is a catalogue of all the available Sparx clips which links to the Higher Tier (see next page). Students should tick the box when they have completed the task for that skill.

	Topic	Sparx Clip	Completed
Unit 1 Number	Using number lines	U922	
	Understanding and ordering integers	U600	
	Understanding and ordering decimals	U435	
	Adding and subtracting integers	U417	
	Adding and subtracting decimals	U478	
	Multiplying and dividing with place value	U735	
	Using a written method to multiply integers	U127	
	Using a written method to multiply decimals	U293	
	Using a written method to divide integers	U453	
	Using a written method to divide with decimals	U868	
	Ordering negative numbers	U947	
	Adding and subtracting with negative numbers	U742	
	Multiplying and dividing with negative numbers	U548	
	Calculating with roots and powers	U851	
	Estimating roots and powers	U299	
	Indices of the form 1/a	U985	
	Indices of the form a/b	U772	
	Using the correct order of operations	U976	
	Using a calculator	U926	
	Index rules with positive indices	U235	
	Index rules with negative indices	U694	
	Using standard form with positive indices	U330	
	Using standard form with negative indices	U534	
	Multiplying and dividing numbers in standard form	U264	
	Adding and subtracting numbers in standard form	U290	
	Standard form with a calculator	U161	
	Rounding integers	U480	
	Rounding decimals	U298	
	Rounding integers using significant figures	U731	
	Rounding decimals using significant figures	U965	
	Estimating calculations	U225	
	Finding error intervals	U657	
	Finding error intervals for calculations	U587	
	Truncating decimals	U108	
	Finding error intervals for truncated numbers	U301	
	Finding factors and using divisibility tests	U211	
	Finding the lowest common multiple (LCM)	U751	
	Finding the highest common factor (HCF)	U529	
	Finding prime numbers	U236	
	Prime factor decomposition	U739	
	Finding the HCF and LCM using prime factor decomposition	U250	
	Multiplying and dividing surds	U633	
	Simplifying surds	U338	
	Adding and subtracting surds	U872	
	Expanding brackets with surds	U499	
	Rationalising denominators containing a single term	U707	
	Rationalising denominators containing two terms	U281	

	Topic	Sparx Clip	Completed
Unit 2:Algebra, Equations and Inequalities	Using algebraic notation	U613	
	Substituting into expressions	U201	
	Substituting into algebraic formulae	U585	
	Substituting into real-life formulae	U144	
	Simplifying expressions by collecting like terms	U105	
	Simplifying expressions using index laws	U662	
	Expanding single brackets	U179	
	Expanding double brackets	U768	
	Expanding triple brackets	U606	
	Factorising into one bracket	U365	
	Factorising quadratic expressions of the form x^2+bx+c	U178	
	Factorising quadratic expressions of the form ax^2+bx+c	U858	
	Factorising the difference of two squares	U963	
	Changing the subjects of formulae	U556	
	Solving equations with one step	U755	
	Solving equations with two or more steps	U325	
	Solving equations with the variable on both sides	U870	
	Solving equations with the variable in the denominator	U505	
	Constructing and solving equations	U599	
	Term-to-term rules	U213	
	Substituting into position-to-term rules	U530	
	Position-to-term rules for arithmetic sequences	U498	
	Position-to-term rules for sequences of patterns	U978	
	Position-to-term rules for quadratic sequences	U206	
	Special sequences	U680	
	Position-to-term rules for geometric sequences	U958	
	Using recurrence relations	U171	

	Topic	Sparx Clip	Completed
Unit 3: Interpreting and Representing Data	Calculating the range	U526	
	Calculating the median	U456	
	Finding the mode	U260	
	Calculating the mean	U291	
	Finding averages from frequency tables	U569	
	Finding averages from diagrams	U854	
	Finding averages from grouped data	U877	
	Choosing suitable averages and solving problems	U717	
	Interpreting frequency tables and two-way tables	U981	
	Interpreting frequency tables with grouped data	U312	
	Drawing and interpreting tally charts	U653	
	Drawing and interpreting pictograms	U506	
	Drawing bar charts	U363	
	Interpreting bar charts	U557	
	Drawing pie charts	U508	
	Interpreting pie charts	U172	
	Drawing line graphs	U590	
	Interpreting line graphs	U193	
	Plotting scatter graphs	U199	
	Interpreting scatter graphs	U277	
	Using lines of best fit	U128	
	Drawing stem-and-leaf diagrams	U200	
	Interpreting stem-and-leaf diagrams	U909	
	Drawing and interpreting frequency polygons	U840	
	Types of data	U322	
	Designing and using questionnaires	U911	
	Collecting and recording data using tables	U120	
	Presenting data and making conclusions	U571	
	Comparing populations using diagrams	U520	

	Topic	Sparx Clip	Completed
Unit 4: Fractions, Percentages & Ratio	Finding fractions of shapes	U679	
	Constructing fractions	U163	
	Finding equivalent fractions	U704	
	Simplifying fractions	U646	
	Ordering fractions	U746	
	Adding and subtracting fractions	U736	
	Converting between mixed numbers and improper fractions	U692	
	Adding and subtracting mixed numbers	U793	
	Ordering fractions and mixed numbers	U439	
	Multiplying fractions	U475	
	Multiplying with mixed numbers	U224	
	Dividing fractions	U544	
	Dividing with mixed numbers	U538	
	Problem solving: Fractions and mixed numbers	U874	
	Converting between fractions, decimals and percentages	U888	
	Ordering fractions, decimals and percentages	U594	
	Converting fractions to recurring decimals	U550	
	Converting recurring decimals to fractions	U689	
	Writing numbers as percentages of other numbers	U925	
	Finding fractions of amounts without a calculator	U881	
	Finding fractions of amounts with a calculator	U916	
	Finding percentages of amounts without a calculator	U554	
	Finding percentages of amounts with a calculator	U349	
	Percentage change without a calculator	U773	
	Percentage change with a calculator	U671	
	Finding original values in percentage calculations	U286	
	Finding the percentage an amount has been changed by	U278	
	Simple interest calculations	U533	
	Compound interest calculations	U332	
	Growth and decay	U988	
	Writing and simplifying ratios	U687	
	Using equivalent ratios to find unknown amounts	U753	
	Converting between ratios, fractions and percentages	U176	
	Sharing amounts in a given ratio	U577	
	Problem solving: Sharing amounts in a given ratio (Higher)	U595	
	Combining ratios	U921	
	Calculating with ratios and algebra	U676	
	Changing ratios	U865	
	Solving direct proportion word problems	U721	
	Solving inverse proportion word problems	U357	
	Currency conversion	U610	
	Interpreting direct proportion equations	U640	

	Topic	Sparx Clip	Completed
Unit 5: Angles & Trigonometry	Understanding, measuring and drawing angles	U447	
	Angles on a line and about a point	U390	
	Vertically opposite angles	U730	
	Angles in triangles	U628	
	Angles in quadrilaterals	U732	
	Combining angle facts	U655	
	Angles on parallel lines	U826	
	Using quadrilateral properties to find angles	U329	
	Angles in polygons	U427	
	Understanding sin, cos and tan	U605	
	Finding unknown sides in right-angled triangles	U283	
	Finding unknown angles in right-angled triangles	U545	
	Using the exact values of trigonometric ratios	U627	
	Angles of elevation and depression	U967	
	Using Pythagoras' theorem in 2D	U385	

	Topic	Sparx Clip	Completed
Unit 6: Graphs	Reading and plotting coordinates	U789	
	Calculating midpoints	U933	
	Solving shape problems involving coordinates	U889	
	Plotting straight line graphs	U741	
	Finding equations of straight line graphs	U315	
	Interpreting equations of straight line graphs	U669	
	Finding the equation of a straight line from its gradient and a point	U477	
	Finding the equation of a straight line from two points on the line	U848	
	Equations of parallel lines	U377	
	Equations of parallel and perpendicular lines	U898	
	Plotting graphs of quadratic functions	U989	
	Interpreting graphs of quadratic functions	U667	
	Finding the turning point of a quadratic graph by completing the square	U769	
	Graphs of cubic functions	U980	
	Plotting linear real-life graphs	U652	
	Using and interpreting linear real-life graphs	U638	
	Finding equations of linear real-life graphs	U862	
	Plotting distance-time graphs	U403	
	Interpreting distance-time graphs	U914	
	Calculating speed from distance-time graphs	U462	
	Plotting distance-time graphs using speeds	U966	
	Plotting velocity-time graphs	U937	
	Calculating acceleration from velocity-time graphs	U562	
	Calculating distances from velocity-time graphs	U611	

Unit	Topic	Sparx Clip	Completed
Unit 7: Area & Volume	Converting units of length, mass and capacity	U388	
	Converting units of area	U248	
	Converting units of volume	U468	
	Problem solving: Converting units of length, area and volume	U663	
	Mixed problems: Finding the area and perimeter of rectangles	U993	
	Finding the area of compound shapes	U970	
	Finding the perimeter of compound shapes	U351	
	Problem solving: Area and perimeter of rectangles and compound shapes (Foundation)	U226	
	Problem solving: Area and perimeter of rectangles and compound shapes (Higher)	U934	
	Finding the area of triangles	U945	
	Finding the area of compound shapes containing triangles	U575	
	Finding the area of parallelograms	U424	
	Finding the area of trapeziums	U265	
	Problem solving: Area of triangles, parallelograms and trapeziums (Foundation)	U343	
	Problem solving: Area of triangles, parallelograms and trapeziums (Higher)	U904	
	Identifying parts of circles	U767	
	Finding the circumference of circles	U604	
	Finding the area of circles	U950	
	Finding the arc length of sectors	U221	
	Finding the area of sectors	U373	
	Nets of 3D shapes	U761	
	Plans and elevations	U743	
	Finding the surface area of cubes and cuboids	U929	
	Finding the surface area of prisms	U259	
	Finding the surface area of pyramids	U871	
	Mixed problems: Finding the surface area of cuboids, prisms and pyramids	U142	
	Finding the surface area of cylinders	U464	
	Finding the surface area of cones	U523	
	Finding the surface area of spheres	U893	
	Mixed problems: Finding the surface area of cones and spheres	U771	
	Finding the surface area of frustums	U334	
	Finding the surface area of composite shapes	U561	
	Finding the volume of cubes and cuboids	U786	
	Finding the volume of prisms	U174	
	Finding the volume of pyramids	U484	
	Finding the volume of cylinders	U915	
	Finding the volume of cones	U116	
	Finding the volume of spheres	U617	
	Mixed problems: Finding the volume of cones and spheres	U426	
	Finding the volume of frustums	U350	
	Finding the volume of composite shapes	U543	

	Topic	Sparx Clip	Completed
Unit 8: Transformations & Constructions	Line and shape properties	U121	
	Symmetry	U849	
	Properties of 3D shapes	U719	
	Translation	U196	
	Reflection	U799	
	Rotation	U696	
	Enlargement by a positive scale factor	U519	
	Enlargement by a positive or negative scale factor	U134	
	Combining transformations	U766	
	Using a pair of compasses	U678	
	Constructing triangles	U187	
	Constructing bisectors of angles	U787	
	Constructing perpendicular bisectors and lines	U245	
	Mixed problems: Constructing bisectors and perpendicular lines	U979	
	Constructing loci	U820	
	Drawing and interpreting scale diagrams	U257	
	Measuring and drawing bearings	U525	
	Calculating bearings	U107	

	Topic	Sparx Clip	Completed
Unit 9: Equations & Inequalities	Completing the square	U397	
	Reading and drawing inequalities on number lines	U509	
	Solving single inequalities	U759	
	Solving inequalities with the variable on both sides	U738	
	Solving double inequalities	U145	
	Constructing and solving inequalities	U337	
	Solving quadratic inequalities	U133	
	Factorising to solve quadratic equations of the form $x^2+bx+c=0$	U228	
	Factorising to solve quadratic equations of the form $ax^2+bx+c=0$	U960	
	Solving quadratic equations by completing the square	U589	
	Solving quadratic equations using the quadratic formula	U665	
	Constructing and solving quadratic equations	U150	
	Solving simultaneous equations using elimination	U760	
	Solving simultaneous equations using substitution	U757	
	Solving simultaneous equations involving quadratics	U547	
	Constructing and solving simultaneous equations	U137	
	Substituting into iterative formulae	U434	
	Finding approximate solutions to equations using iteration	U168	

	Topic	Sparx Clip	Completed
Unit 10: Probability	Using probability phrases	U803	
	Writing probabilities as fractions	U408	
	Writing probabilities as fractions, decimals and percentages	U510	
	Probabilities of mutually exclusive events	U683	
	Expected results from repeated experiments	U166	
	Sample space diagrams	U104	
	Venn diagrams	U476	
	Venn diagrams with set notation	U748	
	Using set notation	U296	
	Frequency trees	U280	
	Tree diagrams for independent events	U558	
	Tree diagrams for dependent events	U729	
	Experimental probabilities	U580	
	Using the product rule for counting	U369	
	Conditional probabilities from tables	U246	
	Conditional probabilities from Venn diagrams	U699	
	Using the conditional probability formula	U821	
	Conditional probabilities from tree diagrams	U806	

	Topic	Sparx Clip	Completed
Unit 11: Multiplicative Reasoning	Calculating with speed	U151	
	Calculating with rates	U256	
	Calculating with density	U910	
	Calculating with pressure	U527	
	Mixed problems: Calculating density and pressure	U842	
	Constructing direct proportion equations	U407	
	Interpreting inverse proportion equations	U364	
	Constructing inverse proportion equations	U138	
	Graphs of direct and inverse proportion	U238	

	Topic	Sparx Clip	Completed
Unit 12: Similarity and congruence	Understanding congruence	U790	
	Understanding similarity	U551	
	Mixed problems: Understanding similarity and congruence	U112	
	Congruent triangles	U866	
	Finding unknown sides in similar shapes	U578	
	Finding the perimeter and area of similar shapes	U630	
	Finding the surface area and volume of similar shapes	U110	

	Topic	Sparx Clip	Completed
Unit 13: More Trigonometry	Trigonometry in 3D shapes	U170	
	Calculating with trigonometry and bearings	U164	
	Graphs of trigonometric functions	U450	
	The sine rule	U952	
	The cosine rule	U591	
	The area rule	U592	
	Using Pythagoras' theorem in 3D	U541	

	Topic	Sparx Clip	Completed
Unit 14: Constructions, Loci & Bearings	Using a pair of compasses	U678	
	Constructing triangles	U187	
	Constructing bisectors of angles	U787	
	Constructing perpendicular bisectors and lines	U245	
	Mixed problems: Constructing bisectors and perpendicular lines	U979	
	Constructing loci	U820	
	Drawing and interpreting scale diagrams	U257	
	Measuring and drawing bearings	U525	
	Calculating bearings	U107	

	Topic	Sparx Clip	Completed
Unit 15: Multiplicative Reasoning	Calculating with speed	U151	
	Calculating with rates	U256	
	Calculating with density	U910	
	Calculating with pressure	U527	
	Mixed problems: Calculating density and pressure	U842	
	Constructing direct proportion equations	U407	
	Interpreting inverse proportion equations	U364	
	Constructing inverse proportion equations	U138	
	Graphs of direct and inverse proportion	U238	

	Topic	Sparx Clip	Completed
Unit 16: Quadratic Equations & Graphs	Plotting graphs of quadratic functions	U989	
	Interpreting graphs of quadratic functions	U667	

	Topic	Sparx Clip	Completed
Unit 17: Perimeter, Area & Volume (2)	Identifying parts of circles	U767	
	Finding the circumference of circles	U604	
	Finding the area of circles	U950	
	Finding the arc length of sectors	U221	
	Finding the area of sectors	U373	
	Nets of 3D shapes	U761	
	Plans and elevations	U743	
	Finding the volume of pyramids	U484	
	Finding the volume of cylinders	U915	
	Finding the volume of cones	U116	
	Finding the volume of spheres	U617	
	Mixed problems: Finding the volume of cones and spheres	U426	
	Finding the volume of composite shapes	U543	

	Topic	Sparx Clip	Completed
Unit 18: Fractions, Indices & Standard Form	Using standard form with positive indices	U330	
	Using standard form with negative indices	U534	
	Multiplying and dividing numbers in standard form	U264	
	Adding and subtracting numbers in standard form	U290	
	Standard form with a calculator	U161	

	Topic	Sparx Clip	Completed
Unit 19: Congruence, Similarity & Vectors	Understanding congruence	U790	
	Understanding similarity	U551	
	Mixed problems: Understanding similarity and congruence	U112	
	Congruent triangles	U866	
	Finding unknown sides in similar shapes	U578	
	Understanding column vectors	U632	
	Adding and subtracting column vectors	U903	
	Multiplying column vectors by a scalar	U564	

	Topic	Sparx Clip	Completed
Unit 20: More Algebra	Graphs of cubic functions	U980	
	Graphs of reciprocal functions	U593	