



Mathematics 2026-2028

Year 10 & 11 Intermediate Revision Booklet

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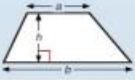
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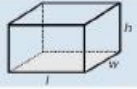
Year	Assessment 1	Assessment 2	Target Grade
10			
11			

Key Formulae

Areas

Rectangle = $l \times w$	
Parallelogram = $b \times h$	
Triangle = $\frac{1}{2} b \times h$	
Trapezium = $\frac{1}{2} (a + b)h$	

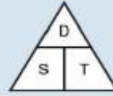
Volumes

Cuboid = $l \times w \times h$	
Prism = area of cross section $\times$ length	
Cylinder = $\pi r^2 h$	
Volume of pyramid = $\frac{1}{3} \times$ area of base $\times h$	

Circles

Circumference = $\pi \times$ diameter, $C = \pi d$	
Circumference = $2 \times \pi \times$ radius, $C = 2\pi r$	
Area of a circle = $\pi \times$ radius squared $A = \pi r^2$	

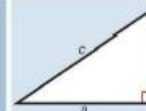
Compound measures

Speed $\text{speed} = \frac{\text{distance}}{\text{time}}$	
Density $\text{density} = \frac{\text{mass}}{\text{volume}}$	
Pressure $\text{pressure} = \frac{\text{force}}{\text{area}}$	

Pythagoras

Pythagoras' Theorem

For a right-angled triangle,
 $a^2 + b^2 = c^2$

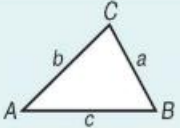


Trigonometric ratios (new to F)

$\sin x^\circ = \frac{\text{opp}}{\text{hyp}}$, $\cos x^\circ = \frac{\text{adj}}{\text{hyp}}$, $\tan x^\circ = \frac{\text{opp}}{\text{adj}}$



Trigonometric formulae

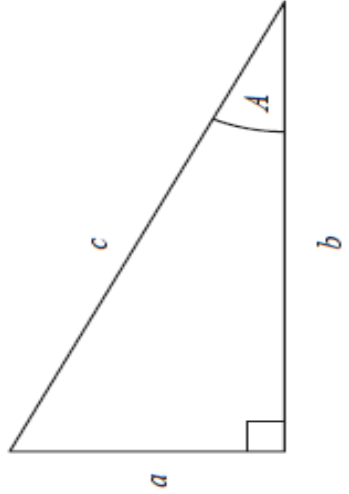
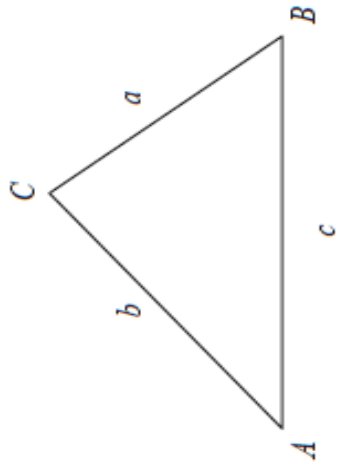
Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$	
Cosine Rule $a^2 = b^2 + c^2 - 2bc \cos A$	
Area of triangle = $\frac{1}{2} ab \sin C$	

Quadratic equations

The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$,
where $a \neq 0$, are given by $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

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 $\times$ length Where r is the radius and d is the diameter: Circumference of a circle = $2\pi r = \pi d$ Area of a circle = πr^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 = $\frac{1}{2} a b \sin C$	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 = $\frac{1}{2} a b \sin C$
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: $\text{Total accrued} = P \left(1 + \frac{r}{100} \right)^n$	Probability Where $P(A)$ is the probability of outcome A and $P(B)$ is the probability of outcome B: $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ $P(A \text{ and } B) = P(A \text{ given } B) P(B)$

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Unit 17	Quadratics and other graphs
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Maths command words

Command Word	Definition	Command Word	Definition
Calculate	Work out the answer using the information given. Show your method.	Interpret	Understand and explain the meaning of mathematical information.
Complete	Fill in all the missing information.	Justify	Give mathematical reasons why an answer is correct.
Construct	Draw something accurately using mathematical equipment.	List	Write down all the answers required.
Convert	Change a value from one form or unit into another.	Plot	Mark points accurately on a graph.
Describe	Explain what happens or what you notice using mathematical language.	Prove	Show with clear mathematical reasoning that something is always true.
Determine	Work out the answer and be sure it is correct.	Represent	Show information using a diagram, graph, table or expression.
Estimate	Find an answer that is close to the exact value.	Round	Give an answer to a stated degree of accuracy.
Evaluate	Work out the value.	Show that	Demonstrate that the given answer is correct using working.
Expand	Multiply out brackets to remove them.	Simplify	Write an answer in its simplest form.
Explain	Show how and why you reached your answer.	Sketch	Draw the main features without needing exact values.
Factorise	Write an expression as a product of its factors usually with brackets.	Solve	Find the value(s) that make a statement true.
Find	Work out the required answer.	State	Write down the answer only.
Give	Provide an answer, often with no method required.	Verify	Check whether a statement is true using mathematics.
Hence	Use a previous answer to help answer the next question.	Work out	Calculate the answer and show your method.
Identify	Pick out the correct answer from the information given.	Write down	Give the answer with little or no calculation needed.

Where to revise

Sparx Maths



Corbett Maths



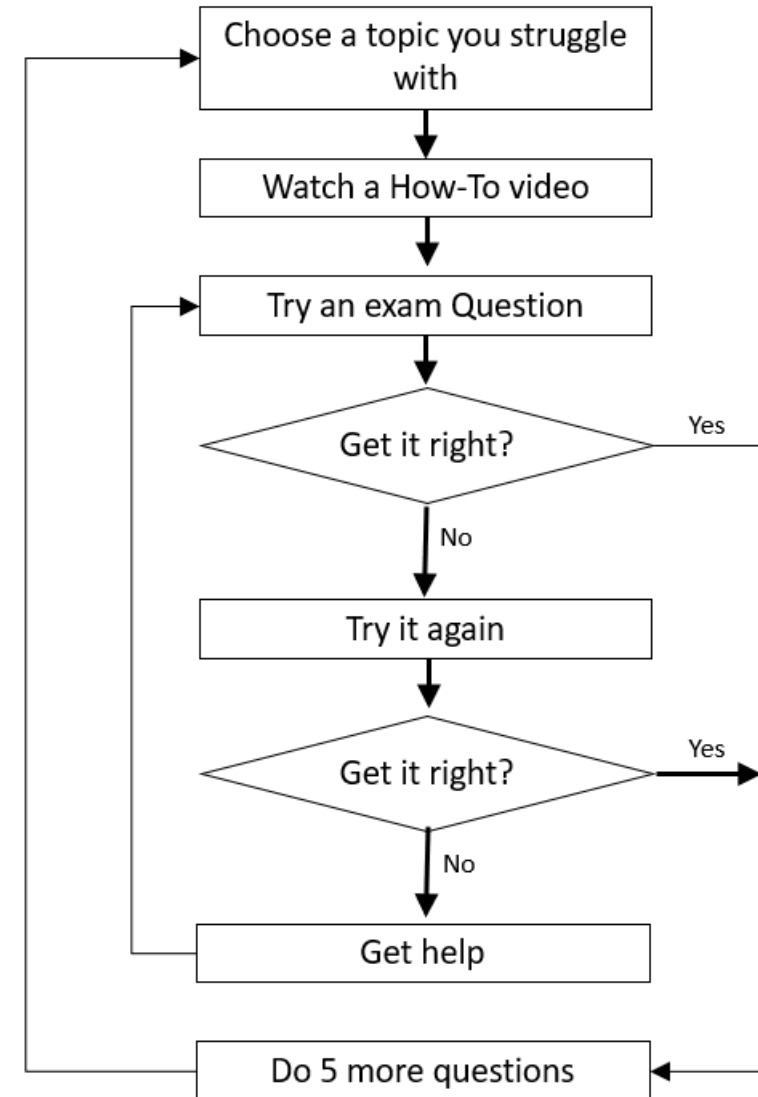
Maths Genie



1st Class Maths



How to revise



Y10 Unit Review

Unit	Topic	Sparx Code
1		
2		
3		
4		
5		

Unit	Topic	Sparx Code
6		
7		
8		
9		
10		

Unit	Topic	Sparx Code
11		
12		
13		
14		
15		

Unit	Topic	Sparx Code
16		
17		
18		
19		
20		

Y11 Revision List

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Unit Overview

Students will develop their understanding of fractions, decimals and percentages, and learn how these different representations of number can be used to solve increasingly complex problems. They will perform calculations with fractions and decimals, compare quantities using proportional reasoning, and solve problems involving percentage change, profit, loss and reverse percentages. Students will also extend their knowledge to compound interest, depreciation and recurring decimals, including proving that recurring decimals can be written as fractions. These skills provide an important foundation for financial mathematics, algebraic reasoning and problem solving in the Edexcel Higher Tier Mathematics specification.



Prior Knowledge

Students have:

- recognised and used simple fractions
- understood place value for whole numbers and decimals
- used the four operations with positive numbers
- converted between simple fractions, decimals and percentages
- solved basic percentage problems
- used ratio to compare quantities
- interpreted information from worded problems



Key Vocabulary

- **interest** – extra money that is paid or earned when money is borrowed or saved.
- **compound interest** – interest that increases over time.
- **simple interest** – interest that remains the same every year.
- **depreciate** – go down in value over time.
- **per annum/annually** - every year.
- **growth** – repeated percentage increases over time, e.g. a population increasing by 3% each year.
- **decay** – repeated percentage decreases over time, e.g. radioactive material decreasing by 5% each year.

Common Errors

Unit 1 - Percentages, Fractions and Decimals (1.5 weeks) – Autumn 1

				0 = don't know it, 1 = familiar, 2 = confident			
Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	Compare and order fractions	3	U746				
2	Add, subtract, multiply and divide fractions including mixed number fractions	3-5	U544 U538 U736 U475 U793 U224				
3	Multiply and divide decimals	3-4	U293 U868				
4	Using fractions, percentages, decimals and ratio to compare quantities in worded context	3-5	U888				
5	Increase/Decrease Percentages with (multipliers) and without a calculator	3-4	U671 U773				
6	Identify and solve reverse percentage problems	5	U286				
7	Percentage change including loss and profit	4-5	U278				
H - 8	Calculate simple and compound interest/depreciation using multipliers and powers, including repeated percentage change, growth and decay problems.	5-6	U553 U332 U988				
H - 9	Convert a recurring decimal into a fraction showing the proof and complete calculations involving recurring decimals, both with and without calculator	6-7	U689 U550				



Unit Overview

Students will develop their understanding of rounding, estimation and numerical accuracy. They will learn how to round numbers to decimal places and significant figures, work efficiently with powers of 10, and use calculators accurately to solve problems. Students will also use estimation to check whether answers are reasonable and explore error intervals, truncation and bounds. These skills provide an important foundation for problem solving, mathematical reasoning and accuracy throughout the Edexcel Higher Tier Mathematics specification



Prior Knowledge

Students have:

- rounded to decimal places and significant figures
- learned the order of operations (BIDMAS)
- used a calculator for basic calculations



Key Vocabulary

- **place value** - the value of a digit because of where it is in a number, e.g. the 5 in 5,432 means 5 thousand.
- **decimal place** – A position to the right of the decimal point. Tenths, hundredths and thousandths are decimal places.
- **significant figures** – The important digits in a number, counted from the first non-zero digit, e.g. 534 to one significant figure is 500.
- **estimate** - Find an answer that is close to the exact answer.
- **error interval** – The range of values that could round to a given number.
- **bound** – the largest or smallest possible value of a rounded measurement, e.g. 8 cm to nearest cm, the upper bound is 8.5
- **truncate** – cut off digits without changing any of the remaining digits, e.g. 5.453 truncated to one decimal place is 5.4.

Common Errors

Unit 2 – Rounding and Accuracy (1.5 weeks) – Autumn 1

				0 = don't know it, 1 = familiar, 2 = confident			
Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	Round numbers to decimal places	2	U298				
2	Round numbers to any amount of significant figures	3	U731 U965				
3	Multiply and divide by powers of 10 and 100 and any whole numbers	2/3	U735				
4	Use a calculator	3	U926				
5	Use significant figures to estimate calculations, including fractions, and solve worded/problem solving questions	3-5	U225				
6	Write and interpret error intervals; understand the difference between truncating and rounding.	4-5	U657 U108				
H - 7	Give upper and lower bounds for measurement	5	U587				
H - 8	Use upper and lower bounds in calculations when adding and multiplying is required, and when subtracting and dividing is required	6-7	U587				



Unit Overview

Students will develop their understanding of ratio and proportion and learn how these ideas can be used to compare quantities, solve practical problems and model real-life situations. They will divide amounts into ratios, work with scale drawings, exchange rates and best-value calculations, and solve increasingly complex proportional reasoning problems. Students will also explore direct and inverse proportion, combine ratios, and use algebra to represent proportional relationships. These skills provide an important foundation for financial mathematics, algebraic reasoning and problem solving in the Edexcel Higher Tier Mathematics specification.



Prior Knowledge

Students have:

- simplified ratios and fractions
- shared amounts in a given ratio
- found fractions and percentages of amounts
- converted between fractions, decimals and percentages
- used scales on maps and diagrams
- solved basic proportion problems



Key Vocabulary

- **proportion** – a relationship where quantities change in a predictable way, e.g. the cost of apples is proportional to the weight purchased.
- **best value** – the option offering the lowest cost per unit, e.g. comparing price per litre or price per kilogram.
- **exchange rate** – the value of one currency compared to another, e.g. £1 = €1.15.
- **combined ratio** – a ratio formed by linking two or more ratios together, e.g. if $A:B = 2:3$ and $B:C = 4:5$.
- **direct proportion** – a relationship where one quantity increases or decreases at the same rate as another
- **inverse proportion** – a relationship where one quantity increases as the other decreases.

Common Errors

Unit 3 – Ratio and Proportion (2 weeks) – Autumn 1

				0 = don't know it, 1 = familiar, 2 = confident			
Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	Divide a whole amount into a given ratio	3	U577				
2	Find a value in a ratio when one amount is given	3	U753				
3	Find a value in a ratio when the difference between two amounts is given	3					
4	Draw and interpret scale drawings	3	U257				
5	Divide quantities into ratios and solve problems involving ratio	4-5	U687 U595				
6	Use ratio in form 1:n and apply it in context, e.g. with maps	4	U753				
7	Solve simple proportion problems e.g. alter recipes for different numbers of people, find the cost of 3 given the cost for 5 etc...	4	U721				
8	Work out and set out the workings correctly to show which products are better value for money	4	M681				
9	Convert between money in different currencies when I am told an exchange rate	5	U610				
10	Use the formulae to solve real life problems involving inverse proportion	5	U357				
11	Combining ratios	5	U921				
H - 12	Solve complex problems linking ratio, fractions, percentages and algebra	5-7	U676 U865				
H - 13	Derive and use formulae linking two variables with direct $y \propto x$ and inverse proportion $y \propto \frac{1}{x}$ including with powers, using values in a table, and recognise the graph shape of direct and inverse proportion.	6-7	U640 U407 U364 U138				
H - 14	Solve problems involving changes to a ratio	6-7	U865				



Unit Overview

Students will be able to use and rearrange formulae involving speed, distance, time, density, mass, volume, pressure, force and area. They will learn how to apply these relationships to real-life situations, including combined journeys, mixed liquids and practical measurement problems. Students will also develop mathematical problem-solving and exam techniques required for Foundation tier Edexcel Maths examinations.



Prior Knowledge

Students have:

- converted between common units of measure
- calculated with decimals and fractions
- substituted values into simple formulae
- rearranged basic calculations using inverse operations
- calculated area and volume of common shapes
- used multiplication and division in real-life contexts



Key Vocabulary

- **formula** – a mathematical rule that shows the relationship between different quantities.
- **speed** – how far something travels in a given time.
- **density** – the mass of an object divided by its volume.
- **mass** – the amount of matter in an object, usually measured in grams or kilograms.
- **volume** – the amount of space taken up by a 3D object.
- **pressure** – the force acting on each unit of area.
- **force** – a push or pull acting on an object.
- **area** – the amount of surface covered by a 2D shape.
- **combined journey** – a journey made up of two or more separate parts.

Common Errors

Unit 4 – Compound Measures (1 week) – Autumn 1

				0 = don't know it, 1 = familiar, 2 = confident			
Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	Convert between units of time: seconds, minutes, hours, weeks	2-3	U902				
2	Use speed-distance-time formula with and without a calculator to a variety of problems	4-5	U151				
3	Use speed-distance-time formula for combined journeys	5	U151				
4	Use the density-mass-volume formula including with 3D shape problems	4-5	U910 U842				
5	Use the density-mass-volume formula when multiple liquids are mixed together	5	U910 U842				
6	Use the pressure-force-area formula for a variety of problems	4-5	U527 U842				



Unit Overview

Students will develop their understanding of powers, indices and standard form, and learn how these ideas can be used to represent very large and very small numbers efficiently. They will use index laws, explore negative and fractional indices, and extend their understanding to surds and exact calculations. Students will also learn how prime factor decomposition, HCF and LCM link to number structure, and how algebraic techniques can be used to manipulate expressions involving powers and surds as examined in the Higher tier Edexcel maths specification



Prior Knowledge

Students have:

- identified factors, multiples and prime numbers
- written numbers as products of prime factors
- found the HCF and LCM of integers
- used square numbers and square roots
- converted between ordinary numbers and standard form
- used basic index laws
- worked confidently with fractions and algebraic notation



Key Vocabulary

- **prime factor form** – expressing a number as a product of prime factors, e.g. $12 = 2 \times 2 \times 3$
- **standard form** – writing numbers in the form $a \times 10^b$
- **reciprocal** – a number that gives 1 when multiplied by the original number, i.e. when we “flip” it.
- **irrational number** – a number that cannot be written exactly as a fraction, e.g. $\sqrt{2}$ or π .
- **rational number** – a number that can be written as a fraction, e.g. $\frac{3}{4}$
- **surd** – an irrational root left in exact form, e.g. $\sqrt{2}$.
- **like surds** – surds with the same root that can be combined, e.g. $\sqrt{2} + 2\sqrt{2} = 3\sqrt{2}$.

Common Errors

Unit 5 – Types of Number (2 weeks) – Autumn 2

- **exact value** – a value written without rounding usually as an integer, fraction or surd.

				0 = don't know it, 1 = familiar, 2 = confident			
Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	Know square numbers (up to 15 x 15) and their corresponding square roots	2					
2	Recall the cubes of 2,3,4,5 and 10 and their corresponding cube roots	3					
3	Write numbers in prime factor form	4	U739				
4	I can find the HCF and the LCM of numbers including in context and write numbers in prime factor form using Venn diagrams	3-5	U529 U751				
5	Convert numbers to and from standard form	4-5	U330 U534				
6	Use basic index laws when multiplying, dividing and raising a power to another power (brackets) of the same base	4-5	U235 U662				
7	Perform calculations with standard form with/without calculator and in context	5	U161 U264 U290				
8	Use the negative (reciprocal) index law	5	U694				
H – 9	Use fractional index laws	6-7	U985 U772				
H – 10	Simplify surds	6-7	U338				
H – 11	Add and subtract surds	6-7	U872				
H - 12	Expand single and double brackets with surds	7	U499 U663				



Unit Overview

Students will develop their understanding of probability and learn how mathematical models can be used to predict outcomes and analyse uncertainty. They will use sample space diagrams, tree diagrams and Venn diagrams to calculate probabilities, explore relative frequency and experimental probability, and develop increasingly sophisticated methods for counting outcomes. Students will also investigate conditional probability, algebraic probability models and probability in unfamiliar contexts as examined in the Edexcel higher tier maths specification.



Prior Knowledge

Students have:

- calculated probabilities from equally likely outcomes
- used fractions, decimals and percentages confidently
- interpreted averages and statistical information
- drawn and interpreted basic tree diagrams
- used set notation in simple contexts



Key Vocabulary

- **relative frequency** – an estimate of probability based on experimental results, e.g. 48 successes in 100 trials gives a relative frequency of 0.48.
- **frequency tree** – a diagram used to organise information and calculate probabilities.
- **sample space diagram** – a table or diagram showing all possible outcomes of an experiment.
- **tree diagram** – a diagram used to show all possible outcomes in a sequence of events.
- **independent events** – events where one outcome does not affect another, e.g. tossing a coin twice.
- **dependent events** – events where one outcome affects the next, e.g. taking counters from a bag without replacement.

Common Errors

Unit 6 – Probability (2 weeks) – Autumn 2

• conditional probability – the probability of an event occurring given that another event has already occurred. • mutually exclusive events – events that cannot occur together, e.g. rolling both a 3 and a 5 on a single dice roll. • experimental probability – a probability calculated from collected data rather than theoretical outcomes.	
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				0 = don't know it, 1 = familiar, 2 = confident			
Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	Draw and understand frequency trees and calculate probabilities from them	3	U280				
2	Find relative probability from experiments and use it to estimate results	4	U166 U580 U246				
3	Draw sample space diagrams and use them to list outcomes and calculate probabilities	4-5	U104				
4	Draw and understand probability tree diagrams for independent (unconditional) events	4-5	U558				
5	Understand and fill in Venn Diagrams from given information	5	U476				
6	Understand set notation ($\in, \cup, \cap, ', \xi$) and use it to fill out Venn Diagrams and calculate probability.	5	U296 U748				
H - 7	To be able to perform calculations with combinations and permutations (product rule for counting)	6-7	U369				
H - 8	Draw and find probabilities from tree diagrams for dependent (conditional) events	6-7	U729				



Unit Overview

Students will develop an understanding of algebra as a way of representing and solving mathematical problems. They will learn how letters can represent numbers, simplify expressions by collecting like terms, substitute values into expressions and formulae, and write algebraic expressions from words and diagrams. Students will also learn how to multiply and divide algebraic terms using index notation and develop their understanding of proof, providing the foundation for future work in algebra, graphs and equations as required in the Edexcel higher tier maths specification.



Prior Knowledge

Students have:

- used the four operations with positive and negative numbers
- worked with powers and indices
- substituted values into simple number calculations
- interpreted mathematical symbols and notation



Key Vocabulary

- **variable** – a letter that can represent different values.
- **unknown** – a value that needs to be found.
- **expression** – a mathematical statement containing numbers, letters and operations.
- **coefficient** – the number multiplying a variable, e.g. 2 is the coefficient of $2x$.
- **like terms** – terms with the same variable, e.g. $2x$ and $3x$
- **equation** – a mathematical statement showing that two expressions are equal, e.g. $5 = 2 + 3$
- **formula** – a rule written using algebra that shows a relationship between quantities, e.g. $V = IR$
- **identity** – an equation that is true for all values of the variable
- **substitute** – replace a variable with a given value.

Common Errors

Unit 7 – Expressions and Formulae (1 week) – Autumn 2

- **proof** – a mathematical argument showing that a statement is always true.
- **consecutive** – following one after another, e.g. 7 and 8 are consecutive integers.

0 = don't know it, 1 = familiar,
2 = confident

Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	Collect like terms	2-3	U105				
2	Know what an equation, formula, unknown, identity and variable is	3	U613				
3	Write an expression or formula from words e.g. $t + 5$, $C = 2r + 3s$, and with shapes	4-5	U613				
4	Substitute positive and negatives values into expressions / formulae with and without a calculator	3-5	U201 U585 U144				
5	Multiply and divide algebraic terms eg. $x \times x^3$, $9x^6 \div 3x^2$, $(3x^2y)^3$	3-5	U662				
H - 6	Use algebra to derive mathematical proofs	6-7	U582				



Unit Overview

Students will learn how to recognise, describe and generate numerical sequences. They will identify patterns in sequences, including Fibonacci sequences, and develop algebraic methods for finding and using the n th term of linear and quadratic sequences. Students will also learn how to determine whether a value belongs to a sequence and use algebra to predict terms efficiently as examined in the Edexcel higher tier specification.



Prior Knowledge

Students have:

- recognised and continued simple number patterns
- used negative numbers
- understood algebraic notation
- collected like terms and simplified expressions
- substituted values into expressions



Key Vocabulary

- **sequence** – an ordered list of numbers that follows a pattern.
- **term** – a number in a sequence.
- **consecutive** – next to each other in order, e.g. 4, 5, 6
- **Fibonacci sequence** – a sequence where each term is the sum of the previous two terms, e.g. 2, 3, 5, 8
- **linear sequence** – a sequence with the same difference between consecutive terms, e.g. 4, 7, 10, 13
- **quadratic sequence** – a sequence with a constant second difference, e.g. 1, 4, 9, 16 ...
- **n th term** – a formula that can be used to find any term in a sequence.
- **position** – the location of a term in a sequence, e.g. in the sequence 4, 7, 10, 13, the third term is 10.

Common Errors

Unit 8 – Sequences (1 week) – Autumn 2

				0 = don't know it, 1 = familiar, 2 = confident			
Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	Recognise and describe sequences including Fibonacci	2-4	U680 U213				
2	Find the nth term of a linear sequence	4	U498				
3	Use the nth term to generate terms of a sequence	4	U530 U978				
4	Determine whether a term belongs in a sequence	4					
H - 5	Understand and find the nth term of quadratic sequences	7-8	U206				



Unit Overview

Students will develop their understanding of algebraic manipulation and learn how complex algebraic expressions can be simplified, expanded and factorised. They will build confidence in working with brackets, quadratic expressions and algebraic fractions, and learn how algebraic techniques can be used to solve increasingly sophisticated mathematical problems. Students will also explore the links between factorisation, expansion and simplification, developing the fluency needed for higher-level algebra and problem solving in the Edexcel higher tier mathematics specification



Prior Knowledge

Students have:

- used algebraic notation confidently
- collected like terms and simplified expressions
- applied basic index laws
- expanded and factorised single brackets
- solved linear equations



Key Vocabulary

- **expand** – multiply a bracket by the term outside it, e.g. expand $2(2x + 3)$
- **factorise** – write an expression as a bracket with a term outside it, e.g. factorise $4x + 6$ is $2(2x + 3)$
- **expression** – a mathematical statement containing numbers, letters and operations.
- **quadratic expression** – an expression containing an x^2 , e.g. $x^2 + 3x + 2$.
- **double brackets** – two brackets multiplied together, e.g. $(x + 2)(x + 1)$
- **cancel** – divide common factors from the numerator and denominator, e.g. $\frac{3x}{6x} = \frac{1}{2}$

Common Errors

Unit 9 – Expanding, Factorising and Algebraic Fractions (2 weeks) – Spring 1

				0 = don't know it, 1 = familiar, 2 = confident			
Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	Expand a single pair of brackets e.g. $4(a - 7)$, $4b(2b - 5)$	4	U179				
2	Factorise into a single pair of brackets with expressions e.g. $4a - 28$, $8b^2 - 20b$, $3x^2y + 9xy^2$	3-5	U365				
3	Expand and simplify expressions: $11+3(x-2)$, $2(a+4)-5(a+6)$	4-5	U179				
4	Expand and simplify double brackets with problem solving. e.g. $(y + 5)(y - 7)$, $(y - 2)^2$, $(2y + 3)(y - 4)$	4-5	U768				
5	Factorise quadratic expressions e.g. x^2+5x+6 , x^2-5x-6	5	U178				
H - 6	Factorising the difference of two squares $x^2 - 81$, $9x^2 - 16$	5-6	U963				
H - 7	Expand triple brackets e.g. $(x - 1)(x - 2)(x - 4)$	6	U606				
H - 8	Factorise quadratics where the coefficient of x^2 is not 1	7	U858				
H - 9	Simplify algebraic fractions when I have to factorise first e.g. $\frac{x^2-x-20}{x^2-25}$	7	U103 U437 U294				
H - 10	Add and subtract basic and more complex algebraic fractions	7	U685				
H - 11	Multiply and divide algebraic fractions	7	U457 U824				



Unit Overview

Students will develop their understanding of perimeter, area and circles, and learn how these concepts can be applied to increasingly complex geometric problems. They will calculate the perimeter and area of compound shapes, use formulae involving circles, and solve problems involving exact values in terms of π . Students will also extend their understanding to sectors, arc lengths and areas of sectors, developing the reasoning and problem-solving skills as examined in the Edexcel higher tier maths specification.



Prior Knowledge

Students have:

- calculated the perimeter of simple shapes
- calculated the area of rectangles, triangles and other basic shapes
- used formulae to calculate measurements
- understood the properties of circles, including radius and diameter
- worked with algebraic expressions and substitution
- solved multi-step numerical problems



Key Vocabulary

- **compound shape** – a shape made from two or more simpler shapes joined together, e.g. an L-shaped floor plan.
- **circumference** – the distance around a circle
- **π (pi)** – the constant ratio of a circle's circumference to its diameter, approximately 3.14159.
- **exact value** – a value written without rounding, e.g. 12π cm.
- **sector** – a region of a circle bounded by two radii and an arc, e.g. a slice of pizza.
- **arc length** – the distance along an arc, e.g. part of a circumference.
- **trapezium** – a quadrilateral with one pair of parallel sides.

Common Errors

0 = don't know it, 1 = familiar,

Unit 10 – 2D Shapes, Area and Perimeter (1.5 weeks) – Spring 1

Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	2 = confident			
				Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	Identify parts of a circle	2	U767				
2	Find perimeter and area of compound shapes	3-5	U226 U351 U575				
3	Calculate area of parallelograms and trapeziums and know the formula for area of a trapezium	4-5	U424 U265				
4	Find the circumference of a circle (including in terms of π) and semi/quarter circles	4-5	U604				
5	Find the area of a circle (including in terms of π) and semi/quarter circles	4-5	U950				
6	Solve problems with circles and compound shapes	5	U604 U950				
H - 7	Find the area and arc length of sectors, including in terms of π	6-7	U373 U221				



Unit Overview

Students will develop their understanding of three-dimensional geometry and measurement. They will learn how to interpret and draw plans, elevations and nets, convert between metric units, and calculate surface area and volume for a wide range of solids. Students will also extend their knowledge to cones, spheres, pyramids, frustums and composite solids as examined in the Edexcel higher tier maths specification.



Prior Knowledge

Students have:

- calculated perimeter and area of 2D shapes
- converted between common metric units of length, mass and capacity
- recognised and described common 3D shapes
- calculated volume and surface area of cuboids and prisms
- substituted values into algebraic expressions and formulae



Key Vocabulary

- **plan** – a view of a 3D object from above, e.g. the floor plan of a building.
- **elevation** – a side or front view of a 3D object.
- **net** – a 2D pattern that can be folded to make a 3D shape, e.g. the net of a cube.
- **volume** – the amount of space inside a 3D object measured in cm^3 .
- **surface area** – the total area of all outside faces and surfaces of a solid.
- **prism** – a solid with a constant cross-section throughout its length, e.g. a triangular prism.
- **frustum** – the solid formed when the top of a cone or pyramid is cut off parallel to its base.
- **composite solid** – a solid made from two or more simpler solids joined together.

Common Errors

Unit 11 – 3D Shapes, Surface Area, Volume and Units (1.5 weeks) – Spring 1

				0 = don't know it, 1 = familiar, 2 = confident			
Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	Draw and interpret plans and elevations and draw nets of solids and recognise solids from their nets	4	U743 U761				
2	Find the volume of regular cuboids, prisms, cylinders and solve volume problems	4-5	U786 U174 U915				
3	Calculate the surface area of cuboids, prisms and cylinders	4-5	U259 U464 U929				
4	Convert between cm^3 , cm^2 and cm and other metric units of volume, capacity and area	5	U248 U468				
5	Convert between surface area and volume of a cube	5	U929 U786				
6	Solve problems with perimeter and algebra area and algebra and volume and algebra	5	U599				
H - 7	Use formulae for volume and surface area of cones and spheres	6-7	U116 U617 U523 U893				



Unit Overview

Students will develop their understanding of equations, inequalities and functions, and learn how algebra can be used to model and solve increasingly complex mathematical problems. They will solve linear equations and inequalities, form equations from real-life situations, work with simultaneous equations and rearrange formulae. Students will also extend their understanding to functions, including function notation and composite as examined in the Edexcel higher tier maths specification.



Prior Knowledge

Students have:

- used algebraic notation confidently
- simplified expressions by collecting like terms
- expanded single brackets and simplified expressions
- used inverse operations in numerical calculations
- substituted values into expressions and formulae
- plotted straight-line graphs
- solved linear equations



Key Vocabulary

- **inequality** – a statement showing one quantity is greater than or less than another, e.g. $5 > 4$.
- **inverse operation** – an operation that reverses another operation, e.g. multiplication and division.
- **simultaneous equations** – two or more equations that share the same solution.
- **intersection** – the point where two graphs cross, e.g. the graphical solution of simultaneous equations.
- **subject of a formula** – the variable isolated on one side of a formula, e.g. v is the subject of $v = u + at$.
- **function** – a rule that maps each input to exactly one output, e.g. $f(x) = 2x + 3$.

Common Errors

Unit 12 – Equations, Inequalities and Functions (2.5 weeks) – Spring 2

- **composite function** – a function formed by combining two functions, e.g. $fg(2)$.

				0 = don't know it, 1 = familiar, 2 = confident			
Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	Solve linear equations with brackets/letters on both sides of the equals sign	4-5	U870				
2	Solve linear equations with fractions like $\frac{x}{4} - 5 = 10$	4-5	U325				
3	Represent and write inequalities on number lines	4	U509				
4	Write values of an inequality e.g. $-2 < x \leq 3$, $-5 < 2x \leq 6$	4-5	U145				
5	Solve linear inequalities: $3x - 1 \leq 11$, $3(x - 2) > 7$, $-5 < 2x + 1 < 9$	4-5	U759 U738				
6	Solve double inequalities	5	U145				
7	Form linear equations in a variety of situations including with shapes and solve them	5	U599				
H – 8	Solve and form linear simultaneous equations	5-6	U760 U137				
9	Solve linear simultaneous graphically by understanding the point of intersection of two lines is the solution	5	U836				
10	Change the subject of the formula	5	U181				
H – 11	Solve linear equations with an unknown in the denominator	6	U505				
H – 12	Understand function notation and be able to answer questions like “find the value of $f(-4)$ ”	6	U637				
H - 13	Know how to find numerical composite functions, e.g. $fg(3)$	7	U448				



Unit Overview

Students will develop their understanding of graphs and coordinate geometry and learn how graphical methods can be used to represent and solve mathematical problems. They will draw and interpret straight-line graphs, calculate gradients, find equations of lines and explore the relationships between gradients and geometric properties. Students will also investigate parallel lines, inequalities and coordinate geometry problems involving algebraic reasoning as examined in the Edexcel higher tier maths specification.



Prior Knowledge

Students have:

- plotted coordinates in all four quadrants
- substituted values into algebraic expressions and formulae
- worked with linear sequences and algebraic notation
- solved linear equations
- recognised and know equations of horizontal, vertical and diagonal ($y = x$) line



Key Vocabulary

- **gradient** – a measure of the steepness of a line, e.g. a gradient of 3 is steeper than a gradient of 2.
- **intercept** – the point where a graph crosses an axis
- **equation of a line** – a rule describing a straight-line graph, e.g. $y = 4x - 2$.
- **midpoint** – the point exactly halfway between two coordinates, e.g. the midpoint of (2,4) and (6,8) is (4,6)
- **parallel lines** – lines that never meet and have the same gradient.

Common Errors

Unit 13 – Straight Line Graphs (2.5 weeks) – Spring 2

				0 = don't know it, 1 = familiar, 2 = confident			
Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	Draw and find the equation of horizontal and vertical lines	3	U741				
2	Draw straight line graphs e.g. $y = 2x - 3$ and $x + y = 7$ with a table of values	4	U741				
3	Calculate the midpoint of a line and the end point when given the midpoint	4-5	U933				
4	Plot and interpret distance-time graphs	4-5	U403 U462 U914				
5	Find the gradient of a line on a graph	5	U477				
6	Find the gradient between two points	5	U477				
7	Identify the equation of a straight line graph in the form $y = mx + c$	5	U315 U477 U848				
8	Interpret real life graphs such as bills and conversion graphs including with gradients and intercepts	5	U638				
9	Know that parallel lines have the same gradient	5	U377				
H – 10	Find missing co-ordinates when given gradient and points and other problems in relation to gradients, e.g. (x, 3) and (6, 8) and gradient is 7	6	U848				
H - 11	Shading regions with inequalities	6	U747				



Unit Overview

Students will develop their understanding of transformational geometry, similarity and vectors. They will learn how shapes can be translated, reflected, rotated and enlarged, and how these transformations can be described mathematically. Students will also investigate combined transformations, similarity, congruence and scale factors, extending their knowledge to vector arithmetic as examined in the Edexcel higher tier maths specification.



Prior Knowledge

Students have:

- plotted coordinates in all four quadrants
- performed translations, reflections, rotations and enlargements on grids
- used algebraic notation in mathematical problem solving



Key Vocabulary

- **transformation** – a change to the position, size or orientation of a shape, e.g. a translation or reflection.
- **combined transformation** – two or more transformations carried out one after another, e.g. a reflection followed by a translation.
- **similar shapes** – shapes with the same shape but not necessarily the same size, e.g. two squares with side lengths 4 cm and 10 cm.
- **congruent shapes** – shapes that are identical in size and shape, e.g. two identical triangles.
- **vector** – a quantity with magnitude and direction, e.g. $\begin{pmatrix} 3 \\ 2 \end{pmatrix}$ means horizontal movement of 3, then vertical movement of 2.
- **scalar** – a number used to multiply a vector

Common Errors

Unit 14 – Transformations, Similarity and Vectors (2 weeks) – Summer 1

				0 = don't know it, 1 = familiar, 2 = confident			
Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	To be able to reflect a shape given an equation of a line	3	U799				
2	To be able to translate a shape	3	U196				
3	To be able to rotate a shape	4	U696				
4	To be able to enlarge a shape with and without a centre of enlargement and with integer or fractional scale factors	4-5	U519				
5	Describe a reflection	4	U799				
6	Describe a translation	4	U196				
7	Describe a rotation	5	U696				
8	Describe an enlargement	5	U519				
9	Understand similar and congruent shapes and find missing lengths and angles in similar shapes by first identifying the scale factor of enlargement	4-5	U551 U790 U578				
10	Understand vectors written in column vector form, add them and multiply them by a scalar quantity	5	U632 U564 U903				
H – 11	Perform and describe a combined transformation	6	U766				
H – 12	Enlarge shapes given a centre of enlargement and either a fractional scale factor or negative scale factor	6	U134 U514				
H – 13	Apply changes to scale factor when looking at areas of similar shapes or volume of similar 3-D shapes	6-7	U110 U630				



Unit Overview

Students will develop their understanding of angle relationships and geometric reasoning. They will learn how angle properties can be used to solve increasingly complex problems involving triangles, quadrilaterals, polygons, parallel lines and bearings. Students will also explore algebraic methods for solving angle problems and extend their understanding to circle theorems and geometric proof as examined in the Edexcel higher tier maths specification.



Prior Knowledge

Students have:

- recognised acute, obtuse, reflex and right angles
- used basic angle facts
- solved simple equations and algebraic expressions
- used parallel line angle facts
- understood angle notation



Key Vocabulary

- **polygon** – a closed shape made entirely from straight line segments, e.g. a hexagon.
- **regular polygon** – a polygon with all sides and all angles equal, e.g. a regular octagon.
- **interior angle** – an angle inside a polygon, e.g. one angle inside a pentagon.
- **exterior angle** – an angle formed outside a polygon when a side is extended.
- **bearing** – a direction measured clockwise from north, e.g. a bearing of 135° .

Common Errors

Unit 15 – Angles (2 weeks) – Summer 1

				0 = don't know it, 1 = familiar, 2 = confident			
Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	Know angle properties – around a point, straight line and vertically opposite angles	3	U390 U730				
2	Know angle properties for triangles and quadrilaterals (derive and use the sum of angles in a triangle and quadrilateral)	4-5	U329 U628 U732				
3	Combine angle facts to find missing angles	4-5	U655				
4	Understand and use alternate and corresponding angles in parallel lines to find missing angles	4-5	U826				
5	Calculate exterior and interior angles of any polygon and use interior / exterior angles to calculate number of sides in regular polygons	4-5	U427				
6	Solve problems using interior / exterior angles and using algebra	5	U427				
7	Understand and accurately draw bearings	5	U525				
8	Measure bearings from diagrams	5	U525				
9	Solve bearings problems that do not require measurement, e.g. when given the bearing of A from B, work out the bearing of B from A	5	U107				
H - 10	Use algebra to derive expressions for angle sums and form equations with unknowns	5-6					



Unit Overview

Students will develop their understanding of trigonometry and learn how geometric relationships can be used to calculate unknown lengths and angles. They will apply Pythagoras' Theorem and trigonometric ratios to increasingly complex problems, including bearings, angles of elevation and depression, and three-dimensional geometry. Students will also extend their knowledge to the area of a triangle formula, exact trigonometric values, and the sine and cosine rules for non-right-angled triangles as examined in the Edexcel higher tier maths specification.



Prior Knowledge

Students have:

- recognised and classified different types of triangles
- calculated square numbers and square roots
- calculated with decimals and fractions confidently
- solved geometrical problems involving shapes and coordinates



Key Vocabulary

- **hypotenuse** – the longest side of a right-angled triangle, opposite the right angle.
- **Pythagoras' Theorem** – a rule for finding missing sides in right-angled triangles
- **trigonometry** – mathematics used to find missing lengths and angles in triangles.
- **opposite** – the side opposite the angle being considered in a triangle.
- **adjacent** – the side next to the angle being considered that is not the hypotenuse.
- **angle of elevation** – the angle measured upwards from a horizontal line, e.g. looking up at the top of a building.
- **angle of depression** – the angle measured downwards from a horizontal line, e.g. looking down from a cliff.

Common Errors

Unit 16 – Trigonometry and Pythagoras (2 weeks) – Summer 1

- **included angle** – the angle between two known sides of a triangle, used in the cosine rule and area formula.

				0 = don't know it, 1 = familiar, 2 = confident			
Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	Recall and be able to calculate square numbers and square roots	2	U851				
2	Find the length of the hypotenuse of right-angled triangles using Pythagoras' Theorem	4	U385 U828				
3	Find the length of the shorter sides of right-angled triangles using Pythagoras' Theorem	5	U385 U828				
4	Use Pythagoras' Theorem to find the length of a line between two coordinates and the height of isosceles triangles and other worded problems	5	U828				
5	Use trigonometry to find missing sides in right-angled triangles	5	U283				
6	Use trigonometry to find missing angles in right-angled triangles	5	U545				
7	Know the exact trigonometric values for sin/cos(0,30,45, 60,90) and tan (0,30,45, 60)	5	U627				
H – 8	Use trigonometry to solve problems including angles of depression/elevation	6	U967				
H – 9	Understand the formula for finding the area of a triangle using $A = \frac{1}{2}ab\sin(C)$	6-7	U592				
H – 10	Use Pythagoras' theorem and trigonometry in 3D geometry	7	U170 U541				
H – 11	Understand and use the Sine Rule	7	U952				
H – 12	Understand and use the Cosine Rule	7	U591				



Unit Overview

Students will develop their understanding of quadratic functions, various curved graphs and equations, and learn how these can be used to model and solve increasingly complex mathematical problems. They will plot and interpret quadratic graphs, solve quadratic equations using a variety of methods, and explore the links between algebraic and graphical representations. Students will also investigate iterative methods as examined in the Edexcel higher tier maths specification.



Prior Knowledge

Students have:

- expanded and factorised algebraic expressions
- substituted values into expressions and formulae
- plotted coordinates and drawn straight-line graphs
- solved linear equations and inequalities



Key Vocabulary

- **quadratic expression** – an algebraic expression containing an x^2 term, e.g. $x^2 + 3x + 2$.
- **quadratic equation** – an equation involving an x^2 term, e.g. $x^2 + 3x + 2 = 0$
- **quadratic graph** – the graph of a quadratic function, e.g. $y = x^2 + 3x + 2$
- **parabola** – the curved shape produced by a quadratic graph.
- **root** – an x -value where a graph crosses the x -axis.
- **turning point** – the maximum or minimum point on a graph
- **iteration** – a repeated process used to approximate solutions, e.g. repeatedly applying a formula to estimate a root.

Common Errors

Unit 17 – Quadratics and other graphs (1.5 weeks) – Summer 2

				0 = don't know it, 1 = familiar, 2 = confident			
Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	Complete a table of values for a quadratic graph and plot it with and without a calculator	5	U989				
2	Solve quadratic equations by factorising	5	U228				
3	Use quadratic graphs to find approximate solutions and turning points	5	U601				
4	Recognise linear, quadratic, cubic, reciprocal and exponential graphs and be able match them to an equation	5	U229 U593 U980				
H – 5	Solve quadratic equations where the coefficient of x^2 is greater than 1	7	U960				
H – 6	Solve quadratic equations using the quadratic formula	7	U665				
H - 7	Use iteration to approximate solutions of quadratics and model populations	7	U168 U434				



Unit Overview

Students will develop their understanding of statistical measures and learn how data can be summarised, compared and interpreted effectively. They will calculate and evaluate different averages, investigate measures of spread, and use graphical methods such as box plots and cumulative frequency curves to analyse distributions as examined in the Edexcel higher tier maths specification.



Prior Knowledge

Students have:

- collected, organised and presented data using tables and charts
- calculated the mean, median, mode and range from lists of data
- interpreted frequency tables and simple graphs
- plotted and interpreted coordinates on graphs



Key Vocabulary

- **distribution** – the way data is spread across different values, e.g. data clustered around a central value.
- **average** – a single value used to represent a set of data, e.g. mean, median or mode.
- **frequency** – the number of times a value occurs, e.g. a frequency of 8 means a value appears eight times.
- **grouped frequency table** – a table where data is organised into intervals, e.g. heights grouped into classes.
- **outlier** – a value that is significantly larger or smaller than the rest of the data, e.g. 100 in the set 7, 8, 9, 10, 100.
- **quartile** – a value that divides ordered data into four equal parts.
- **interquartile range (IQR)** – the difference between the upper and lower quartiles.
- **measure of spread** – a statistic showing how spread out a data set is, e.g. range or interquartile range.

Common Errors

Unit 18 – Averages and Spread (2 weeks) – Summer 2

• box plot – a diagram showing the median, quartiles and extreme values of a data set. • cumulative frequency – the running total of frequencies up to a particular value. • compare – identify similarities and differences between data sets using statistical evidence usually an average and measure of spread.	
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				0 = don't know it, 1 = familiar, 2 = confident			
Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	Know the advantages and disadvantages of using averages in different situations	3	U717				
2	Find mean from an ungrouped frequency table	3	U877 U569				
3	Estimate mean of a grouped frequency table	4	U877 U569				
4	Find the median, mode and range from a frequency table	4	U877 U569				
5	Solve problems involving averages and range including in algebraic contexts	5	U717				
6	Identify and consider outliers when calculating the range in a distribution	5					
H - 7	Find upper and lower quartiles and the interquartile range from listed data	6	U961				
H - 8	Draw and interpret boxplots from listed data	6	U879 U837				
H - 9	Draw cumulative frequency curves and use them to estimate the median, quartiles and frequencies in a range	6	U182 U642				
H - 10	Compare and contrast sets of data using an average and a measure of spread, including with cumulative frequency graphs and box plots	6	U507				



Unit Overview

Students will develop their understanding of statistical diagrams and learn how data can be represented, interpreted and analysed effectively. They will explore a range of graphical methods, including pie charts, stem-and-leaf diagrams, scatter graphs, histograms and frequency polygons. Students will also investigate correlation, sampling techniques and graphical methods used to estimate and compare data as examined in the Edexcel higher tier maths specification.



Prior Knowledge

Students have:

- collected and organised data in tables
- calculated averages and measures of spread
- interpreted simple charts and graphs
- compared data sets using statistical evidence



Key Vocabulary

- **stem-and-leaf diagram** – a method of displaying ordered numerical data, e.g. 4|74|74|7 represents 47.
- **frequency** – the number of times a value occurs, e.g. a frequency of 12 means the value appears 12 times.
- **two-way table** – a table used to organise data into two categories, e.g. favourite sport and year group.
- **frequency polygon** – a graph formed by joining the midpoints of grouped frequency intervals.
- **scatter graph** – a graph used to investigate the relationship between two variables.
- **correlation** – a relationship between two variables, e.g. height and arm span.
- **line of best fit** – a line used to show the general trend of data on a scatter graph.
-

Common Errors

Unit 19 – Displaying and Interpreting Data (1.5 weeks) – Summer 2

• histogram – a graph used to display grouped continuous data where bar area represents frequency. • frequency density – frequency divided by class width, used when drawing histograms.	
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				0 = don't know it, 1 = familiar, 2 = confident			
Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	Draw and interpret pie charts	3-4	U508 U172				
2	Draw and interpret stem and leaf diagrams	4	U200 U909				
3	Draw and interpret two way-tables	4	U981				
4	Draw and interpret frequency polygons	4	U840				
5	Produce a scatter graph and distinguish correlation	4	U199 U277				
6	Draw a line of best fit, interpret properties of the line and use the line to extrapolate results	4	U128				
H - 6	Know how the capture-recapture sampling method can be used to estimate populations	6	U328				
H - 7	Complete a histogram from a grouped frequency table, or complete a grouped frequency table given a histogram	7	U185 U814				



Unit Overview

Students will develop their understanding of geometric constructions and loci and learn how accurate geometric methods can be used to solve problems involving distance, position and regions. They will use compasses, rulers and protractors to construct lines, angles and triangles, and investigate loci based on distance from points and lines as examined in the Edexcel higher tier maths specification.



Prior Knowledge

Students have:

- measured and drawn angles accurately using a protractor
- used rulers to measure and draw line segments accurately
- recognised properties of triangles and quadrilaterals
- understood perpendicular and parallel lines
- used circles and arcs in geometrical diagrams



Key Vocabulary

- **construction** – an accurate geometric drawing made using a compass, ruler and/or protractor.
- **arc** – part of the circumference of a circle, e.g. the curved marks drawn when constructing a bisector.
- **bisect** – divide exactly into two equal parts, e.g. bisecting a 60° angle creates two 30° angles.
- **line bisector** – a line that divides a line segment into two equal parts.
- **angle bisector** – a line that divides an angle into two equal angles.
- **perpendicular bisector** – a line that cuts another line in half at 90° .
- **locus (plural loci)** – the set of all points that satisfy a given condition, e.g. all points 4 cm from a fixed point.
- **equidistant** – the same distance from two or more objects, e.g. points equidistant from two towns.

Common Errors

Unit 20 – Constructions and Loci (1 week) – Summer 2

				0 = don't know it, 1 = familiar, 2 = confident			
Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	Use a compass	2	U678				
2	Bisect a line using a compass	4	U245				
3	Bisect an angle using a compass	4	U787				
4	Accurately draw a triangle with compass and/or protractor	4	U187				
5	Draw the perpendicular from a point to a line and the perpendicular from a point on the line	5	U245				
6	Understand loci, equidistant from: two points, two lines, a single point and a single line	5	U820				
7	Shade regions that satisfy certain criteria using loci	5	U820				

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This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

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