



Mathematics 2026-2028

Year 10 & 11 Foundation Revision Booklet

Name: _____

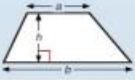
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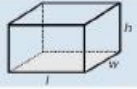
Year	Assessment 1	Assessment 2	Target Grade
10			
11			

Key Formulae

Areas

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

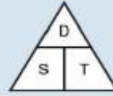
Volumes

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 $A = \pi r^2$	

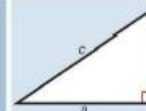
Compound measures

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

Pythagoras

Pythagoras' Theorem

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

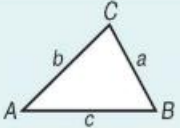


Trigonometric ratios (new to F)

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



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

Foundation Tier Formulae Sheet

Perimeter, area and volume

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

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

Volume of a prism = area of cross section $\times$ length

Where r is the radius and d is the diameter:

$$\text{Circumference of a circle} = 2\pi r = \pi d$$

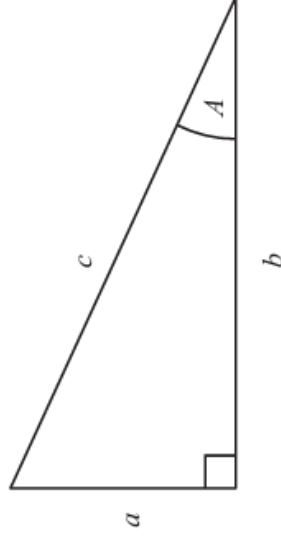
$$\text{Area of a circle} = \pi r^2$$

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:



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

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 :

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

END OF EXAM AID

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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



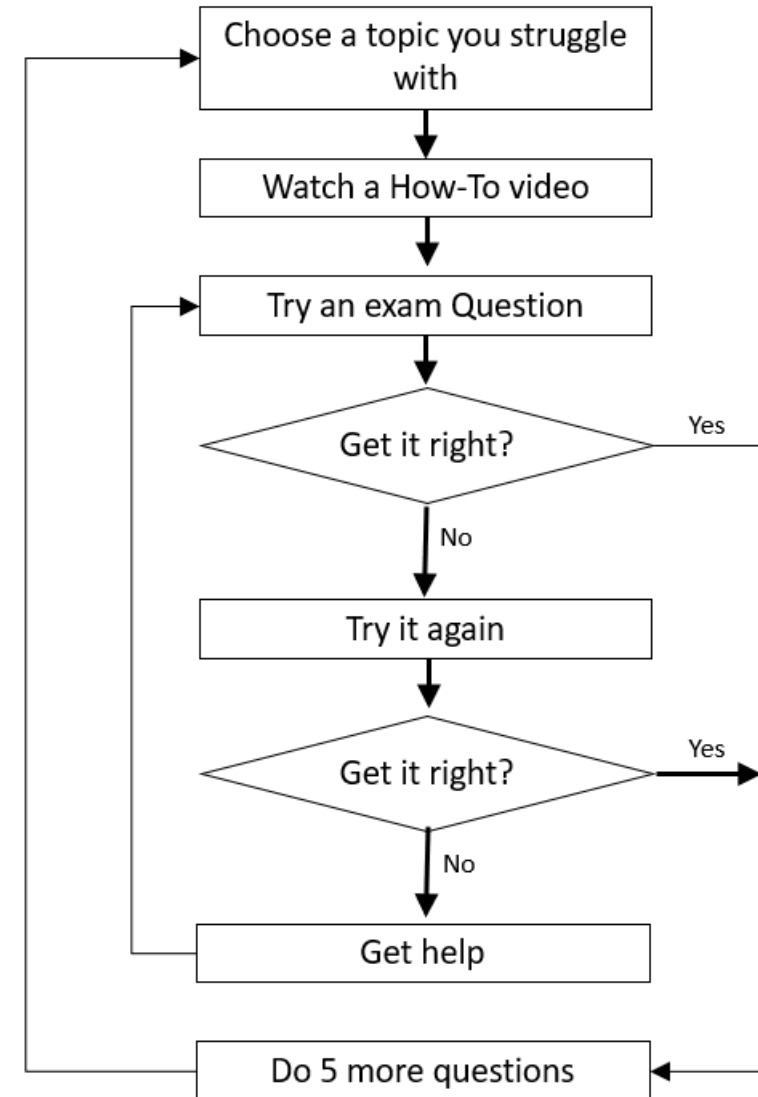
Maths Genie



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

[illegible]



Unit Overview

Students will learn how fractions, decimals and percentages can be used to represent and compare quantities in different ways. They will develop skills in converting between fractions, decimals and percentages, calculating with fractions and decimals, and solving problems involving percentages. Students will also explore percentage change, reverse percentages and compound interest, helping them apply mathematical reasoning to real-life financial situations as applied in the Foundation tier Edexcel maths specification.



Prior Knowledge

Students have:

- converted between fractions, decimals and percentages
- used operations on fractions including mixed numbers
- worked out percentages of amounts and increase/decrease
- multiplied and divided decimals



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.
- **numerator** – top of a fraction.
- **denominator** – bottom of a fraction.
- **profit** - the amount gained when the selling price is greater than the cost price, e.g. buy for £50 and sell for £60 gives a profit of £10
- **loss** - the amount lost when the selling price is less than the cost price, e.g. buy for £50 and sell for £40 gives a loss of £10

Common Errors

Unit 1 – Percentages, Fractions and Decimals (2.5 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	Shade fractions and read fractions from diagrams	1	U679				
2	Put decimals in size order	2	U435				
3	Add and subtract decimals with no calculator	2	U478				
4	Compare and order fractions	3	U746				
5	Recall certain fraction / decimal / percentage conversions	1					
6	Convert between fractions, decimals and percentages	1-2	U176 U888				
7	Convert between mixed number and improper fractions	2	U692				
8	Find a fraction of an amount	3	U881 U916				
9	Add, subtract, multiply and divide fractions including mixed number fractions	3-5	U544 U538 U736 U475 U793 U224				
10	Multiply and divide decimals	3-4	U293 U868				
11	Using fractions, percentages and decimals to compare quantities in worded context	3-5	U176				
12	Increase/Decrease Percentages with (multipliers) and without a calculator	3-4	U671 U773				
13	Percentage change including loss and profit	4-5	U278				
14	Identify and solve reverse percentage problems	5	U286				
15	Calculate simple and compound interest/depreciation using multipliers and powers	5	U553 U332				



Unit Overview

Students will develop their fluency with number skills and estimation techniques. They will learn how to order and round numbers, use significant figures, work with powers of 10, apply BIDMAS accurately and use calculators effectively. Students will also explore estimation, error intervals and the difference between truncation and rounding as applied in the Foundation tier Edexcel maths specification.



Prior Knowledge

Students have:

- rounded to decimal places
- 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.
- **round** – Change a number to a simpler value that is close to the original number.
- **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.
- **BIDMAS** – The order to carry out calculations: Brackets, Indices, Division and Multiplication, Addition and Subtraction.
- **estimate** - Find an answer that is close to the exact answer.
- **error interval** – The range of values that could round to a given number.
- **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	Order numbers and understand place value	2	U900				
2	Round numbers to decimals places	2	U298				
3	Round numbers to any amount of significant figures	3	U731 U965				
4	Multiply and divide by powers of 10 and 100 and any whole numbers	2/3	U735				
5	Use BIDMAS in all calculations	3	U976				
6	Use a calculator	3	U926				
7	Use significant figures to estimate calculations, including fractions, and solve worded/problem solving questions	3-5	U225				
8	Write error intervals; understand the difference between truncating and rounding.	4-5	U657 U108				



Unit Overview

Students will be able to use ratio, proportion and scale in a variety of contexts. They will learn how to divide quantities in a given ratio, work with scale drawings and maps, solve proportion problems, compare value for money, and apply ratio reasoning to real-life situations. Students will also develop problem-solving skills needed for Foundation tier Edexcel Maths examinations



Prior Knowledge

Students have:

- used multiplication and division facts confidently
- found fractions of amounts
- simplified fractions
- interpreted and used scales on diagrams and number lines
- used decimals and percentages to compare quantities
- solved simple multi-step problems involving money and measures



Key Vocabulary

- **ratio** – a way of comparing two or more quantities.
- **proportion** – the relationship between quantities that increase or decrease together.
- **inverse proportion** – when one quantity increases while another decreases.
- **scale** – the relationship between a length on a drawing or map and the actual length.
- **exchange rate** – the value of one currency compared to another currency.
- **best value** – the most cost-effective option when comparing products or services.

Common Errors

Unit 3 – Ratio and Proportion (2.5 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	Use ratio notation and write in its simplest form	1	U687				
2	Write a ratio as a fraction	2	U176				
3	Divide a whole amount into a given ratio	3	U577				
4	Find a value in a ratio when one amount is given	3	U753				
5	Find a value in a ratio when the difference between two amounts is given	3					
6	Draw and interpret scale drawings	3	U257				
7	Divide quantities into ratios and solve problems involving ratio	4-5					
8	Use ratio in form 1:n and apply it in context, e.g. with maps	4	U687				
10	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				
11	Work out and set out the workings correctly to show which products are better value for money	4	M681				
12	Convert between money in different currencies when I am told an exchange rate	5	U610				
13	Use the formulae to solve real life problems involving inverse proportion	5	U357				
14	Combining ratios	5	U921				



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 fluency with negative numbers, powers, roots and standard form. They will learn how numbers can be expressed using prime factors and index notation, and apply these skills to find the HCF and LCM of numbers. Students will also use and manipulate standard form in calculations and solve problems involving index laws. These topics provide the foundation for calculations used throughout the Edexcel Foundation tier GCSE Mathematics course.



Prior Knowledge

Students have:

- used multiplication facts and times tables
- recognised square numbers and simple square roots
- used factors and multiples
- simplified fractions using common factors
- worked with negative numbers on number lines
- carried out calculations using a calculator and written methods



Key Vocabulary

- **square number** – the result of multiplying a number by itself, e.g. 16 is a square number because $4 \times 4 = 16$
- **square root** – a value that, when multiplied by itself, gives the original number, e.g. $\sqrt{16} = 4$
- **cube number** – the result of multiplying a number by itself twice, e.g. 8 is a cube number because $2 \times 2 \times 2 = 8$
- **cube root** – a value that, when cubed, gives the original number, e.g. $\sqrt[3]{8} = 2$.
- **factor** – a number that divides exactly into another number.
- **multiple** – a number that is on the times table list of another number, e.g. multiples of 3 are 3, 6, 9...
- **prime number** – a number with exactly two factors: 1 and itself, e.g. 7 only has two factors.

Common Errors

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

• highest common factor (HCF) – the largest factor shared by two or more numbers. • lowest common multiple (LCM) – the smallest multiple shared by two or more numbers. • standard form – a way of writing very large or very small numbers using powers of 10. • reciprocal – a number that gives 1 when multiplied by the original number, i.e. when we “flip” it.	
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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	Add, subtract, multiply and divide with negative numbers	2	U548 U742				
2	Know square numbers (up to 15 x 15) and their corresponding square roots	2					
3	Recall the cubes of 2,3,4,5 and 10 and their corresponding cube roots	3					
4	Write numbers in prime factor form	4	U739				
5	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				
6	Use index laws to multiply numbers of the same base	4	U235				
7	Use index laws to divide numbers of the same base	4	U235				
8	Use index laws to raise a power to a power (brackets)	4	U235				
9	Convert numbers to and from standard form	4-5	U330 U534				
10	Perform calculations with standard form with/without calculator and in context	5	U161 U264 U290				
11	Use the negative (reciprocal) index law	5	U694				



Unit Overview

Students will develop an understanding of probability and how it can be used to predict the likelihood of events. They will learn to calculate probabilities from equally likely outcomes, experiments and diagrams, and apply probability reasoning using frequency trees, sample space diagrams, Venn diagrams and tree diagrams. Students will also learn how probability can be used to model real-life situations and make informed predictions. This is covered on the Edexcel foundation tier maths specification.



Prior Knowledge

Students have:

- interpreted simple tables and charts
- used fractions, decimals and percentages
- added and multiplied fractions and decimals
- used number skills to calculate proportions and percentages



Key Vocabulary

- **probability** – a measure of how likely an event is to happen.
- **outcome** – a possible result of an experiment or event.
- **relative frequency** – an estimate of probability based on experimental results.
- **sample space** – a list of all possible outcomes.
- **systematic listing** – an organised method of listing all possible outcomes.
- **frequency tree** – a diagram used to organise information and calculate probabilities.
- **Venn diagram** – a diagram used to show relationships between sets.
- **tree diagram** – a diagram showing all possible sequences of outcomes.
- **independent events** – events where one outcome does not affect another, e.g. rolling a dice and a coin flip.

Common Errors

Unit 6 – Probability (2 weeks) - 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	Know that probability adds up to 1	2	U683				
2	Use the probability scale 0 to 1	2	U803				
3	Write the probability for equally likely outcomes	2	U408				
4	Draw and understand frequency trees and calculate probabilities from them	3	U280				
5	Understand how to solve probability problems via systematic listing	3	U714				
6	Find relative probability from experiments and use it to estimate results	4	U166 U580				
7	Draw sample space diagrams and use them to list outcomes and calculate probabilities	4-5	U104				
8	Understand and fill in Venn Diagrams from given information	5	U476				
9	Understand set notation ($\in, \cup, \cap, ', \xi$) and use it to fill out Venn Diagrams and calculate probability.	5	U296 U748				
10	Draw and understand probability tree diagrams for independent (unconditional) events	5	U558				



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, providing the foundation for future work in algebra, graphs and equations as required in the Edexcel foundation tier maths specification.



Prior Knowledge

Students have:

- used the four operations with positive and negative numbers
- used brackets and BIDMAS in calculations
- 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

				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	Understand algebraic notation	2	U613				
2	Collect like terms	2-3	U105				
3	Know what an equation, formula, unknown, identity and variable is	3	U613				
4	Substitute positive and negatives values into expressions / formulae with and without a calculator	3-5	U201 U585 U144				
5	Write an expression or formula from words e.g. $t + 5$, $C = 2r + 3s$, and with shapes	4-5	U613				
6	Multiply and divide algebraic terms eg. $x \times x^3$, $9x^6 \div 3x^2$, $(3x^2y)^3$	3-5	U662				



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 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 foundation 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
- **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					



Unit Overview

Students will learn how to expand and simplify algebraic expressions involving single brackets and how to factorise expressions into a single pair of brackets. They will develop an understanding of the connection between expanding and factorising as inverse processes and apply these skills to algebraic and real-life contexts such as perimeter and area problems as examined in the Edexcel foundation tier maths specification.



Prior Knowledge

Students have:

- understood algebraic notation
- collected like terms and simplified expressions
- multiplied and divided algebraic terms
- used indices in simple algebraic calculations



Key Vocabulary

- **bracket** – a grouping symbol used to show that terms belong together, e.g. $(2x + 3)$
- **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.
- **common factor** – a factor shared by every term in an expression.

Common Errors

Unit 9 – Expanding and Factorising Single Brackets (1 week) – 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 brackets e.g. $4(a - 7)$, $4b(2b - 5)$ including with a problem solving context, e.g. expressions for area	3-4	U179				
2	Factorise into a single pair of brackets e.g. $4a - 28$, $8b^2 - 20b$, $3x^2y + 9xy^2$	3-5	U365				
3	Expand and simplify expressions with single brackets: $11+3(x-2)$, $2(a+4)-5(a+6)$	4-5	U179				



Unit Overview

Students will learn how to calculate perimeter, area and circumference for a variety of shapes. They will develop an understanding of the properties of circles, use formulae involving π , and apply area and perimeter skills to compound shapes and real-life problems. Students will build confidence in selecting appropriate methods and formulae and interpreting measurements in context as examined in the Edexcel foundation tier maths specification.



Prior Knowledge

Students have:

- recognised common 2D shapes
- multiplied and divided whole numbers and decimals
- used simple formulae
- calculated the perimeter and area of basic shapes
- worked with units of length and area
- used algebraic notation in simple formulae



Key Vocabulary

- **perimeter** – the total distance around the outside of a shape.
- **area** – the amount of space inside a shape in 2D.
- **compound shape** – a shape made from two or more simple shapes joined together.
- **radius** – the distance from the centre of a circle to its edge.
- **diameter** – the distance across a circle through its centre.
- **circumference** – the distance around a circle.
- **π (pi)** – a mathematical constant used in circle calculations, approximately equal to 3.14.
- **trapezium** – a quadrilateral with one pair of parallel sides.

Common Errors

Unit 10 – 2D Shapes, Area and Perimeter (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	Find the perimeter of any shape	2	U993				
2	Find the area of squares, rectangles and triangles	2	U945				
3	Identify parts of a circle	2	U767				
4	Find perimeter and area of compound shapes	3-5	U226 U351 U575				
5	Calculate area of parallelograms and trapeziums and know the formula for area of a trapezium	4-5	U424 U265				
6	Find the circumference of a circle (including in terms of π) and semi/quarter circles	4-5	U604				
7	Find the area of a circle (including in terms of π) and semi/quarter circles	4-5	U950				
8	Solve problems with circles and compound shapes	5	U604 U950				



Unit Overview

Students will develop their understanding of metric units, three-dimensional shapes and measurement. They will learn to convert between units, interpret plans, elevations and nets, and calculate volume and surface area of cuboids, prisms and cylinders. Students will also apply these skills in multi-step problems involving area, volume and algebraic expressions as examined in the Edexcel foundation tier maths specification.



Prior Knowledge

Students have:

- used common metric units for length, mass and capacity
- calculated perimeter and area of 2D shapes
- used formulae to calculate measurements
- recognised common 2D and 3D shapes
- worked with decimals and unit conversions
- calculated with fractions and percentages
- substituted values into formulae



Key Vocabulary

- **capacity** – the amount a container can hold.
- **volume** – the amount of space inside a 3D object.
- **plan** – a view of a 3D object from above.
- **elevation** – a side or front view of a 3D object.
- **net** – a two-dimensional pattern that can be folded to make a 3D shape.
- **cross-section** – the shape formed when a solid is cut through.
- **prism** – a solid shape with a constant cross-section throughout its length.
- **surface area** – the total area of all the outside faces and surfaces of a 3D shape.

Common Errors

Unit 11 – 3D Shapes, Surface Area, Volume and Units (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	Know common metric units	2	U497				
2	Estimate length, volume, capacity and weight	3	U102				
3	Convert between metric units	2-3	U388				
4	Draw and interpret plans and elevations and draw nets of solids and recognise solids from their nets	4	U743 U761				
5	Find the volume of regular cuboids, prisms, cylinders and solve volume problems	4-5	U786 U174 U915				
6	Calculate the surface area of cuboids, prisms and cylinders	4-5	U259 U464 U929				
7	Convert between cm^2 and cm and other metric units of volume, capacity and area	5	U248 U468				
8	Convert between surface area and volume of a cube	5	U929 U786				
9	Solve problems with perimeter and algebra area and algebra and volume and algebra	5	U599				



Unit Overview

Students will learn how to solve and interpret linear equations and inequalities using a variety of methods. They will develop confidence in forming equations from real-life situations, representing inequalities on number lines, solving simultaneous equations and rearranging formulae. Students will also explore the links between algebraic, graphical and numerical representations of solutions as examined in the Edexcel foundation tier maths specification.



Prior Knowledge

Students have:

- understood algebraic notation
- simplified expressions by collecting like terms
- expanded single brackets
- substituted values into expressions and formulae
- used inverse operations in numerical calculations



Key Vocabulary

- **equation** – a mathematical statement showing that two expressions are equal, e.g. $5 = 2 + 3$.
- **solve** – find the value of a variable that makes a statement true, e.g. solve $x + 5 = 8$, so $x = 3$.
- **inequality** – a statement showing that one value is greater than or less than another, e.g. $4 > 3$
- **inverse operation** – an operation that reverses another operation, e.g. multiplication is the inverse of division.
- **simultaneous equations** – two equations that share the same solution.
- **intersection** – the point where two graphs cross.
- **subject of a formula** – the variable on its own in a formula, e.g. y is the subject in $y = mx + c$

Common Errors

Unit 12 – Equations and Inequalities (2 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	Solve linear equations e.g. $2x + 3 = 11$ and $10 + 2x = 15$	2-3	U325				
2	Solve linear equations with brackets/letters on both sides of the equals sign	4-5	U870				
3	Solve linear equations with fractions like $\frac{x}{4} - 5 = 10$	4-5	U325				
4	Represent inequalities on number lines	4	U509				
5	Write inequalities from a number line	4	U509				
6	Write values of an inequality e.g. $-2 < x \leq 3$, $-5 < 2x \leq 6$	4-5	U145				
7	Solve linear inequalities: $3x - 1 \leq 11$, $3(x - 2) > 7$, $-5 < 2x + 1 < 9$	4-5	U759 U738				
8	Solve double inequalities	5	U145				
9	Form linear equations in a variety of situations including with shapes and solve them	5	U599				
10	Solve linear simultaneous equations	5	U760				
11	Solve linear simultaneous graphically by understanding the point of intersection of two lines is the solution	5	U836				
12	Change the subject of the formula	5	U181				



Unit Overview

Students will learn how coordinates and graphs can be used to represent mathematical relationships visually. They will develop skills in plotting coordinates, drawing and interpreting graphs, calculating gradients and identifying equations of straight lines. Students will also explore distance-time graphs and real-life graphs, helping them understand how graphical representations can be used to model and interpret everyday situations as examined in the Edexcel foundation tier maths specification.



Prior Knowledge

Students have:

- used number lines and scales accurately
- interpreted coordinates in all four quadrants.
- substituted values into algebraic expressions
- solved simple linear equations
- calculated with fractions and decimals



Key Vocabulary

- **axis (axes)** – a reference line used on a graph, e.g. the x-axis is horizontal and the y-axis is vertical.
- **coordinate** – a pair of numbers used to describe a position, e.g. (3, 5).
- **origin** – the point where the axes meet, e.g. (0, 0).
- **midpoint** – the point exactly halfway between two points, e.g. the midpoint of (2, 4) and (6, 8) is (4, 6).
- **gradient** – a measure of how steep a line is, e.g. a gradient of 3 is steeper than a gradient of 2.
- **intercept** – where a graph crosses an axis
- **equation of a line** – a rule describing a straight-line graph.
- **parallel lines** – lines that never meet and have the same gradient

Common Errors

Unit 13 – Straight Line Graphs (2 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, label and scale an axis	1					
2	Read / plot co-ordinates on a 2D graph	1	U789				
3	Draw and find the equation of horizontal and vertical lines	3	U741				
4	Draw straight line graphs e.g. $y = 2x - 3$ and $x + y = 7$ with a table of values	4	U741				
5	Calculate the midpoint of a line	4	U933				
6	Plot and interpret distance-time graphs	4-5	U403 U462 U914				
7	Find the gradient of a line on a graph	5	U477				
8	Find the gradient between two points	5	U477				
9	Identify the equation of a straight line graph in the form $y=mx +c$	5	U315 U477				
10	Interpret real life graphs such as bills and conversion graphs including with gradients and intercepts	5	U638				
11	Know that parallel lines have the same gradient	5	U377				



Unit Overview

Students will learn how shapes can be moved, enlarged and reflected in the coordinate plane while maintaining or changing their size and orientation. They will develop their understanding of transformational geometry through reflections, rotations, translations and enlargements, and learn how to describe these transformations mathematically. Students will also explore similar and congruent shapes and use vectors to represent movement as examined in the Edexcel foundation tier maths specification.



Prior Knowledge

Students have:

- plotted coordinates in all four quadrants
- used rulers, protractors and grids accurately
- recognised common 2D shapes
- calculated with positive and negative numbers
- interpreted scale drawings
- solved problems involving lengths and angles



Key Vocabulary

- **line of symmetry** – a line that divides a shape into two identical mirror images, e.g. the vertical line through a rectangle.
- **rotational symmetry** – when a shape looks unchanged after being rotated, e.g. a square.
- **order of rotational symmetry** – the number of times a shape matches itself in one full turn, e.g. a square has order 4.
- **construction** – an accurate geometric drawing using a compass and ruler, e.g. constructing a perpendicular bisector.
- **bisect** – divide exactly into two equal parts, e.g. bisecting an angle of 60° creates two angles of 30° .

Common Errors

Unit 14 – Transformations, Similarity and Vectors (2 weeks) - Spring 2

• perpendicular – meeting at a right angle, e.g. two roads crossing at 90°. • perpendicular bisector – a line that cuts another line in half at 90°. • locus (loci) – the set of all points that satisfy a given rule, e.g. points 3 cm from a fixed point. • equidistant – the same distance from two or more objects, e.g. a point that is equidistant from two towns. • arc – part of the circumference of a circle, e.g. the curved marks made by a compass.	
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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	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				



Unit Overview

Students will develop their understanding of angles and geometric reasoning. They will learn to measure, draw and classify angles, use angle facts to calculate missing angles, and apply properties of triangles, quadrilaterals and polygons. Students will also explore angles in parallel lines, bearings and algebraic methods for solving angle problems as examined in the Edexcel foundation tier maths specification.



Prior Knowledge

Students have:

- recognised common 2D shapes
- interpreted mathematical notation and symbols
- applied basic geometric properties of shapes
- understood what acute, right, obtuse and reflex angles are
- understood basic angle facts



Key Vocabulary

- **angle** – the amount of turn between two lines, e.g. a right angle is 90° .
- **parallel lines** – lines that stay the same distance apart and never meet, e.g. railway tracks.
- **polygon** – a closed 2D shape made from straight line segments, e.g. a hexagon.
- **regular polygon** – a polygon with all sides and angles equal, e.g. a regular octagon.
- **interior angle** – an angle inside a polygon, e.g. the interior angles of a pentagon.
- **exterior angle** – an angle formed outside a polygon, e.g. the angle formed when a side is extended.
- **bearing** – a direction measured clockwise from north, e.g. a bearing of 120° .

Common Errors

Unit 15 – Angles (2 weeks) – Summer 1

Topic	Core Concepts, Knowledge and Skills	Grade	Sparx Code	0 = don't know it, 1 = familiar, 2 = confident			
				Y10 PKC	Y11 PKC	Y10 Review	Y11 Review
1	Use angle notation and geometric language	2	U447				
2	Measure / draw angles / use a protractor	2	U447				
3	Know acute, obtuse and reflex angles	2	U447				
4	Know angle properties – around a point, straight line and vertically opposite angles	3	U390 U730				
5	Know angle properties for triangles and quadrilaterals (derive and use the sum of angles in a triangle and quadrilateral)	4-5	U329 U628 U732				
6	Combine angle facts to find missing angles	4-5	U655				
7	Understand and use alternate and corresponding angles in parallel lines to find missing angles	4-5	U826				
8	Calculate exterior and interior angles of any polygon and use interior / exterior angles to calculate number of sides in regular polygons	4-5	U427				
9	Solve problems using interior / exterior angles and using algebra	5	U427				
10	Understand and accurately draw bearings	5	U525				
11	Measure bearings from diagrams	5	U525				
12	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				
13	Use algebra to derive expressions for angle sums and form equations with unknowns	5					



Unit Overview

Students will learn how right-angled triangles can be used to calculate unknown lengths and angles. They will develop their understanding of square numbers, square roots, Pythagoras' Theorem and trigonometry, and apply these skills to solve increasingly complex geometric problems. Students will also learn exact trigonometric values and use mathematical reasoning to calculate missing sides and angles efficiently as examined in the Edexcel foundation tier maths specification.



Prior Knowledge

Students have:

- calculated square numbers and recognised simple square roots
- recognised and classified triangles
- used formulae to calculate measurements
- rearranged simple equations
- worked confidently with calculators



Key Vocabulary

- **right-angled triangle** – a triangle containing an angle of exactly 90° .
- **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 sides and angles in triangles.
- **opposite** – the side opposite the angle being considered.
- **adjacent** – the side next to the angle being considered.
- **exact value** – a value written precisely without a calculator.

Common Errors

Unit 16 – Trigonometry and Pythagoras (1.5 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	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 trigonometry to find missing sides in right-angled triangles	5	U283				
5	Use trigonometry to find missing angles in right-angled triangles	5	U545				
6	Know the exact trigonometric values for sin/cos(0,30,45, 60,90) and tan (0,30,45, 60)	5	U627				



Unit Overview

Students will learn how quadratic expressions, equations and graphs can be used to model mathematical relationships. They will develop skills in expanding and factorising quadratic expressions, generating and interpreting quadratic graphs, and using graphs to identify roots and turning points. Students will also explore special algebraic forms such as the difference of two squares as examined in the Edexcel foundation tier maths specification.



Prior Knowledge

Students have:

- expanded and simplified single brackets
- collected like terms and simplified algebraic expressions
- substituted values into expressions and formulae
- plotted coordinates and drawn straight-line graphs
- used tables of values
- solved linear equations



Key Vocabulary

- **quadratic expression** – an algebraic expression containing an x^2 term, e.g. $x^2 + 3x + 2$
- **quadratic graph** – the graph of a quadratic expression, e.g. $y = x^2 + 3x + 2$
- **double brackets** – two brackets multiplied together, e.g. $(x + 2)(x + 1)$
- **factorise quadratic** – write an expression as a product of two brackets, e.g. $x^2 + 3x + 2$ is $(x + 2)(x + 1)$
- **root** – an x -value where a graph crosses the x -axis.
- **turning point** – the highest or lowest point on a graph
- **approximate solution** – a solution found from reading a graph rather than calculated exactly

Common Errors

Unit 17 – Quadratics (1.5 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	Expand and simplify double brackets with problem solving. e.g. $(y + 5)(y - 7)$, $(y - 2)^2$, $(2y + 3)(y - 4)$	4-5	U768				
2	Complete a table of values for a quadratic graph with and without a calculator	5	U989				
3	Plot for positive and negative values a quadratic from a table of values	5	U989				
4	Use quadratic graphs to find approximate solutions and turning points	5	U601				
5	Factorise quadratic expressions e.g. x^2+5x+6 , x^2-5x-6	5	U178				
6	Factorising the difference of two squares $x^2 - 81$,	5	U963				
7	Solve quadratic equations by factorising	5	U228				
8	Recognise linear, quadratic, cubic and reciprocal graphs and be able match them to an equation	5	U229 U593 U980				



Unit Overview

Students will learn how data can be summarised and analysed using averages and measures of spread. They will develop skills in calculating and interpreting the mean, median, mode and range from lists of data and frequency tables. Students will also learn when different averages are most appropriate and use statistical techniques to solve problems in numerical and algebraic contexts as examined in the Edexcel foundation tier maths specification.



Prior Knowledge

Students have:

- ordered numbers from smallest to largest
- used the four operations with whole numbers and decimals
- interpreted tables and charts
- understood mode, median, mean and range



Key Vocabulary

- **data** – a collection of information or values, e.g. test scores of 12 students.
- **average** – a single value used to describe a set of data, e.g. mean, median or mode.
- **mean** – the average found by adding all values and dividing by how many values there are, e.g. the mean of 2, 4 and 6 is 4.
- **median** – the middle value when data is arranged in order, e.g. the median of 2, 5, 7, 9, 12 is 7.
- **mode** – the value that appears most often, e.g. the mode of 3, 3, 4, 7 is 3.
- **range** – the difference between the largest and smallest values, e.g. the range of 4, 7, 10, 15 is 11.
- **frequency** – the number of times a value occurs, e.g. a frequency of 5 means the value appears five times.

Common Errors

Unit 18 – Averages and Spread (1.5 weeks) - Summer 2

• frequency table – a table showing values and how often they occur, e.g. scores and their frequencies. • grouped frequency table – a table where data is organised into intervals, e.g. ages 0–10, 11–20 and 21–30. • class interval – one of the groups in a grouped frequency table, e.g. 20–30. • estimate – an answer that is close to the exact value, e.g. estimating the mean from grouped data. • measure of spread – a statistic showing how spread out data is, e.g. the range.	
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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	Find the mode from a list of numbers	2	U260				
2	Find the range from a list of numbers	2	U526				
3	Find the median from a list of numbers	2-3	U456				
4	Find the mean from a list of numbers	2-3	U291				
5	Know the advantages and disadvantages of using averages in different situations	3	U717				
6	Find mean from an ungrouped frequency table	3	U877 U569				
7	Estimate mean of a grouped frequency table	4	U877 U569				
8	Find the median, mode and range from a frequency table	4-5	U877 U569				
9	Solve problems involving averages and range including in algebraic contexts	5	U717				



Unit Overview

Students will learn how data can be displayed, interpreted and analysed using a variety of statistical diagrams and graphs. They will develop skills in drawing and interpreting charts, tables and graphs, identifying relationships in data and making predictions using lines of best fit. Students will also explore correlation, sampling and the advantages of different ways of representing information as examined in the Edexcel foundation tier maths specification.



Prior Knowledge

Students have:

- read and interpreted simple tables
- collected and recorded data
- used scales accurately
- calculated averages and range
- measured and drawn angles using a protractor
- worked confidently with fractions, decimals and percentages



Key Vocabulary

- **pictogram** – a chart that uses pictures or symbols to represent data, e.g. one picture represents 10 people.
- **frequency** – the number of times a value occurs, e.g. a frequency of 8 means the value appears eight times.
- **two-way table** – a table used to organise data into two categories, e.g. favourite sport and year group.
- **scatter graph** – a graph used to investigate the relationship between two variables, e.g. height and arm span.
- **correlation** – a relationship between two variables, e.g. taller students often have a larger arm span shows a positive correlation.
- **line of best fit** – a line drawn to show the general trend in a scatter graph.

Common Errors

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

• stem and leaf diagram – a method of displaying ordered numerical data, e.g. 4 7 represents 47. • frequency polygon – a graph created by joining the midpoints of grouped data intervals. • sample – a smaller group selected from a larger population, e.g. surveying 50 students from a school of 1000.	
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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 scale a set of axis	1					
2	Measure / draw angles / use a protractor	2	U447				
3	Know angle properties – angles around a point etc	2	U390				
4	Draw and interpret pictograms	2-3	U506				
5	Draw and interpret bar charts including composite and dual	2-3	U363				
6	Draw and interpret pie charts	3-4	U172				
7	Draw and interpret two way-tables	4	U981				
8	Produce a scatter graph and distinguish correlation.	4	U199 U277				
9	Draw a line of best fit, interpret properties of the line and use the line to extrapolate results	4	U128				
10	Draw and interpret stem and leaf diagrams	4	U200 U909				
11	Draw and interpret frequency polygons	4	U840				
12	Understand random sampling and sampling by proportion	5	U162				



Unit Overview

Students will learn how geometric properties can be used to construct, analyse and describe shapes accurately. They will develop skills in symmetry, compass constructions and loci, and learn how geometric constructions can solve problems involving distance and position. Students will also explore perpendicular bisectors, angle bisectors and regions that are equidistant from points and lines as examined in the Edexcel foundation tier maths specification.



Prior Knowledge

Students have:

- recognised common 2D shapes
- measured and drawn angles using a protractor
- used rulers accurately to measure lengths
- understood basic metric lengths
- understood basic properties of lines and angles
- drawn simple geometric diagrams



Key Vocabulary

- **transformation** – a change made to a shape's position, size or orientation, e.g. a reflection or rotation.
- **reflection** – a transformation that flips a shape across a mirror line.
- **translation** – a transformation that slides a shape without changing its size or orientation.
- **rotation** – a transformation that turns a shape about a fixed point, e.g. rotate 90° clockwise about the origin.
- **enlargement** – a transformation that changes the size of a shape, e.g. enlargement with scale factor 2.
- **congruent** – shapes that are exactly the same size and shape, e.g. two identical triangles.

Common Errors

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

• similar – shapes that have the same shape but may have different sizes, e.g. two squares with side lengths 3 cm and 6 cm. • vector – a quantity with size and direction, e.g. $\begin{pmatrix} 3 \\ 2 \end{pmatrix}$ means move across 3 and up 2. • scalar – a number used to multiply a vector, e.g. $3\begin{pmatrix} 3 \\ 2 \end{pmatrix}$ is the same as $\begin{pmatrix} 9 \\ 6 \end{pmatrix}$	
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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	Recognise reflection symmetry and draw lines of symmetry	2	U849				
2	Understand rotational symmetry and identify its order	2	U849				
3	Use a compass	2	U678				
4	Bisect a line using a compass	4	U245				
5	Bisect an angle using a compass	4	U787				
6	Accurately draw a triangle with compass and/or protractor	4	U187				
7	Draw the perpendicular from a point to a line and the perpendicular from a point on the line	5	U245				
8	Understand loci, equidistant from: two points, two lines, a single point and a single line	5	U820				

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