

YEAR 11

Key information

Low Stakes Assessment

Each topic outlined below will be assessed via an Exit Ticket at the end of the unit of learning. This will be teacher marked and whole class feedback will be provided.

Summative Assessment

Students will sit multiple mock GCSE assessments across the year that indicate their current grade and inform predicted grades used for college applications. Students will be provided with the GCSE content list in advance and are expected to revise independently for these assessments.

ILS

- In term 1, students in Y11 are expected to complete a set of topic-specific exam questions each week. These will be handed in on Wednesdays and self-marked in a lesson later in the week.
- In term 2 and 3, students in Y11 are expected to complete and self-mark a weekly past paper. Prior to the paper being issued, teachers will work through a set of similar questions in lesson that students can use as a worked example when completing the paper at home.
- Key vocabulary should be practiced using flashcards or self-quizzing from the unit knowledge organiser.

Wider Reading

- Students can look in more depth at each unit of learning via the Sparx Maths Independent Learning function. This has videos and practice questions for self-study.
- Students can use revision guides for wider reading on a topic.
- Students can use BBC Bitesize for wider reading on a topic.

SMSC

Students spiritual, moral, social and cultural development is fostered in maths through discussion activities in which different perspectives on a problem are discussed. Students are exposed to the work of a vast array of mathematicians through the curriculum and explicit cultural links to art, architecture and language are made where appropriate.



Autumn Term

G8. Working with Circles

Composites

- Circumference and arc length
- Area of circles and sectors
- Volume of prisms and cylinders
- Surface area of prisms and cylinders

Composites (Higher Only)

- Similar areas and volumes
- Circle theorems:
 - Angles at the centre and circumference
 - Angles in a semi-circle
 - Angles in a cyclic quadrilateral
 - Angles in the same segment

Key Vocabulary

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| Arc | A portion of the circumference. |
| Diameter | A line segment connecting two points on the circumference of a circle passing through the centre. |
| Radius | A line segment connecting the centre to the circumference of a circle. |
| Sector | A portion of the circle enclosed by two radii and an arc. |

How to help at home

- [Arc Length Video \(Corbett Maths\)](#)
- [Area of a Sector Video \(Corbett Maths\)](#)
- [Surface Area Video \(Corbett Maths\)](#)
- [Volume Video \(Corbett Maths\)](#)
- [Similar Areas Video \(Corbett Maths\)](#)
- [Similar Volumes Video \(Corbett Maths\)](#)
- [Circle Theorems Video \(Corbett Maths\)](#)

Careers Links

These topics are essential in careers such as architecture, engineering, construction, manufacturing, surveying and product design, where professionals calculate lengths, areas, volumes and surface areas to design structures, estimate materials, manufacture components and ensure projects are accurate, safe and cost-effective. They also develop spatial reasoning, precision and problem-solving skills that are highly valued across STEM industries.

G9. Vectors

Composites

- Vector notation
- Vector multiplication

Key Vocabulary

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|-----------|---|
| Co-Linear | Vectors that create a straight line due to being parallel and sharing a common point. |
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Vector addition and subtraction	Magnitude Size (of a number or the length of a vector). x-component The top number in a column vector, this describes the movement in the x direction. y-component The bottom number in a column vector, this describes the movement in the y direction.
Composites (Higher Only) - Vectors in shapes - Parallel and colinear vectors - Geometric proof	
How to help at home Column Vectors Video (Corbett Maths) Vectors Video (Corbett Maths)	Careers Links These topics are used in careers such as engineering, architecture, computer graphics, robotics, physics and surveying, where professionals use vectors to represent direction and magnitude, model movement and forces, design structures, and prove geometric relationships. They develop logical reasoning, spatial awareness and analytical problem-solving skills that are essential in many STEM careers.

A9. Non-Linear Graphs

Composites - Plot and read quadratic, cubic and reciprocal graphs - Recognise graph shapes - Roots and intercepts of quadratics	Key Vocabulary Asymptote A straight line that a graph will never meet. Cubic A curved graph with an equation of the form $y=ax^3 + bx^2 + cx + d$. Quadratic A U-shaped graph with an equation of the form $y=ax^2 + bx + c$. Reciprocal (Graph) A graph with two curves, an asymptote and an equation of the form $y=\frac{k}{x}$.
Composites (Higher Only) - Plot and read exponential graphs - Equations of circles - Equation of a tangent	
How to help at home Plotting Quadratic Graphs Video (Corbett Maths) Cubic Graphs Video (Corbett Maths) Exponential Graphs Video (Corbett Maths) Reciprocal Graphs Video (Corbett Maths)	Careers Links These topics are used in careers such as engineering, architecture, computer science, data science, physics and game development, where professionals model real-world situations, analyse graphical data, design curved structures, and use equations to solve complex problems. They



• Equation of a Circle Video (Corbett Maths) • Equation of a Tangent Video (Corbett Maths)	develop analytical thinking, mathematical modelling and interpretation skills that are essential across STEM and technology-based industries											
N11. Non-Calculator Methods												
Composites • Exact Form • Rounding and truncating numbers • Error Intervals • Estimating Calculations • Fraction Arithmetic • Solving Multi-Step Problems	Key Vocabulary <table><tr><td>Bound</td><td>The maximum or minimum value that a number could have been before it was rounded.</td></tr><tr><td>Degree of Accuracy</td><td>How close something is to the true value</td></tr><tr><td>Exact Form</td><td>A value that has not been approximated (often a surd, fraction or in terms of pi).</td></tr><tr><td>Rounding</td><td>Approximating to the nearest bound.</td></tr><tr><td>Truncating</td><td>Approximating to the lower bound.</td></tr></table>		Bound	The maximum or minimum value that a number could have been before it was rounded.	Degree of Accuracy	How close something is to the true value	Exact Form	A value that has not been approximated (often a surd, fraction or in terms of pi).	Rounding	Approximating to the nearest bound.	Truncating	Approximating to the lower bound.
Bound	The maximum or minimum value that a number could have been before it was rounded.											
Degree of Accuracy	How close something is to the true value											
Exact Form	A value that has not been approximated (often a surd, fraction or in terms of pi).											
Rounding	Approximating to the nearest bound.											
Truncating	Approximating to the lower bound.											
Composites (Higher Only) • Evaluating negative fractional indices • Expanding with surds • Rationalising the denominator • Converting recurring decimals to fractions												
How to help at home • Error Intervals Video (Corbett Maths) • Estimating Calculations Video (Corbett Maths) • Additive Operations with Fractions Video (Corbett Maths) • Multiplying Fractions Video (Corbett Maths) • Dividing Fractions Video (Corbett Maths) • Rationalising Denominators Video (Corbett Maths) • Recurring Decimals to Fractions Video (Corbett Maths)	Careers Links These topics are used in careers such as engineering, construction, science, finance, pharmacy and manufacturing, where professionals perform accurate calculations, estimate values, manage measurement tolerances, and work with exact values to ensure precision and reliability. They develop numerical fluency, attention to detail and problem-solving skills that are essential in technical and analytical professions											
A10. Functions												
Composites • Substitute into functions	Key Vocabulary											



- Forming Expressions - Trig Functions	Function A rule that connects an input value to one output value. Inverse A mathematical opposite.
Composites (Higher Only) Composite functions	
How to help at home Functions (BBC Bitesize) Please note students do not need to understand and use function notation (e.g. $f(x)$), all function questions on OCR use function machines.	Careers Links These topics are used in careers such as engineering, computer programming, data science, physics, architecture and game development, where professionals use functions, algebraic expressions and trigonometry to model real-world situations, design systems, analyse data and solve complex problems. They develop logical thinking, mathematical modelling and problem-solving skills that are highly valued across STEM and technology-based careers.
A11. Manipulating Expressions	
Composites - Form and solve equations and inequalities with fractions - Algebraic argument and proof - Simplify complex expressions	Key Vocabulary Identity A mathematical relationship stating two expressions are equivalent. Proof A logical step-by-step argument that demonstrates that a mathematical statement is true. Solve To find a numerical value that satisfies a mathematical relationship (makes it true).
Composites (Higher Only) - Completing the square - Finding turning points - Simplifying Algebraic Fractions - Additive and multiplicative operations with algebraic fractions - Solving Algebraic Fraction Equations	
How to help at home Refer to the 'Algebra Tiles' video on the Alder Maths Department page	Careers Links These topics are used in careers such as engineering, computer science, economics, actuarial science, data analysis and scientific research, where



• Algebraic Proof Video (Corbett Maths) • Completing the Square Video (YouTube) • Simplifying Algebraic Fractions Video (Corbett Maths) • Additive Operations with Algebraic Fractions Video (Corbett Maths) • Multiplying Algebraic Fractions Video (Corbett Maths) • Dividing Algebraic Fractions Video (Corbett Maths)	professionals manipulate algebraic expressions, solve complex equations, model relationships and justify solutions using mathematical proof. They develop logical reasoning, analytical thinking and advanced problem-solving skills that are essential across STEM and analytical professions.
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Spring Term	
P7. Collecting, Representing & Interpreting Data 3	
Composites • Averages from lists and tables • Reverse mean • Averages problems • Comparing distributions	Key Vocabulary Mean A type of average - the sum of the data divide by the number of items. Median A type of average - the middle piece of data in an ordered list. Mode A type of average - the most frequent piece of a data in a set.
Composites (Higher Only) • Drawing and interpreting histograms • Drawing and interpreting cumulative frequency diagrams • Box Plots	
How to help at home • Averages from an Ungrouped Table (BBC Bitesize) • Averages from a Grouped Table (BBC Bitesize) • Drawing Histograms Video (Corbett Maths) • Interpreting Histograms Video (Corbett Maths) • Histograms GCSE Qus Video (Corbett Maths) • Drawing Cumulative Frequency Video (Corbett Maths)	Careers Links These topics are used in careers such as data analysis, medicine, finance, market research, engineering and quality control, where professionals collect, interpret and compare data to identify trends, make informed decisions and communicate findings clearly. They develop statistical reasoning, analytical thinking and data-handling skills that are essential across many scientific, business and technical careers.



• Interpreting Cumulative Frequency Video (Corbett Maths) • Drawing Box Plots Video (Corbett Maths) • Comparing Box Plots Video (Corbett Maths)											
G10. Transforming & Constructing											
Composites • Reflection • Rotation • Translation • Enlargement • Identifying transformations and series of transformations • Constructions and loci	Key Vocabulary <table border="0"> <tr> <td>Construct</td><td>Create an accurate drawing using a pencil, ruler, compass and/or protractor.</td></tr> <tr> <td>Enlargement</td><td>Changing the size of a shape.</td></tr> <tr> <td>Reflection</td><td>A transformation mapping an object from one position to another of equal distance from a given line.</td></tr> <tr> <td>Rotation</td><td>A transformation that turns an object in a given direction.</td></tr> <tr> <td>Translation</td><td>A transformation moving an object in a vector with an x and y component.</td></tr> </table>	Construct	Create an accurate drawing using a pencil, ruler, compass and/or protractor.	Enlargement	Changing the size of a shape.	Reflection	A transformation mapping an object from one position to another of equal distance from a given line.	Rotation	A transformation that turns an object in a given direction.	Translation	A transformation moving an object in a vector with an x and y component.
Construct	Create an accurate drawing using a pencil, ruler, compass and/or protractor.										
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Reflection	A transformation mapping an object from one position to another of equal distance from a given line.										
Rotation	A transformation that turns an object in a given direction.										
Translation	A transformation moving an object in a vector with an x and y component.										
Composites (Higher Only) • Negative enlargement • Invariant points • Trigonometric graphs • Transformations of trigonometric graphs											
How to help at home • Transforming Trig Graphs Video (Corbett Maths) • Negative Enlargements Video (Corbett Maths) • Invariant Points Video (Corbett Maths) • Translation with Vectors (Corbett Maths) • Rotations Video (Corbett Maths) • Reflections Video (Corbett Maths) • Enlargements Video (Corbett Maths)	Careers Links These topics are used in careers such as architecture, engineering, computer graphics, animation, robotics, surveying and design, where professionals use geometric transformations, constructions and trigonometric models to create accurate designs, analyse movement, map locations and develop digital models. They develop spatial reasoning, precision and problem-solving skills that are highly valued across engineering, technology and creative industries.										
R5. Multiplicative Reasoning											
Composites	Key Vocabulary										



• Using Scale Factors • Proportion Equations • Proportion Problems • Speed, Distance, Time Problems • Density, Mass, Volume • Pressure, Force, Area • Multiplicative Problems	Density A property measuring how tightly packed particles of a substance are. Pressure The amount of force applied perpendicularly to a given area. Proportion A relationship that describes how two things change in relation to each other. Scale Factor A multiplier describing a change in size. Speed The rate at which an object covers distance.
Composites (Higher Only) <i>No additional content in this unit</i>	
How to help at home • Refer to the 'Ratio Tables' video on the Alder Maths Department page • SDT Video (Corbett Maths) • DMV Video (Corbett Maths) • PFA Video (Corbett Maths)	Careers Links These topics are used in careers such as engineering, construction, logistics, architecture, transport, science and manufacturing, where professionals apply proportional reasoning to calculate scale, speed, density, pressure and force when designing structures, planning journeys, testing materials and solving practical problems. They develop mathematical modelling, problem-solving and quantitative reasoning skills that are essential across many technical and scientific careers.
G11. Geometric Reasoning	
Composites • Angles in parallel lines and shapes • Interior and exterior angles of polygons • Proving geometric facts • Pythagoras and Trigonometry	Key Vocabulary Exterior Angle An angle created by extending the side of a polygon. Hypotenuse The longest side on a right-angled triangle. It is always opposite the right angle. Interior Angle An angle inside a shape.
Composites (Higher Only) • Circle theorems: - Recap of theorems from G8 - Angle between the radius and chord	Parallel Two straight lines that never intersect and are always the same distance apart (the same gradient).



- Angle between radius and tangent - Two tangents from a point - Alternate segment theorem	
How to help at home • Circle Theorems Video (Corbett Maths) • Angles in Parallel Lines (BBC Bitesize) • Pythagoras Video (Corbett Maths) • Trigonometry (BBC Bitesize)	Careers Links These topics are used in careers such as architecture, engineering, construction, surveying, aviation and computer graphics, where professionals apply geometric reasoning, angle properties, trigonometry and circle theorems to design structures, calculate distances, produce accurate plans and solve spatial problems. They develop logical reasoning, precision and problem-solving skills that are essential across STEM and technical professions.
A12. Algebraic Reasoning	
Composites • Use rules for sequences • Show that with algebra • Show that with shape	Key Vocabulary nth term A position to term rule for a sequence. Show that To produce step-by-step working leading to a given conclusion.
Composites (Higher Only) <i>No additional content in this unit</i>	
How to help at home • Exam Practice – Past Papers OCR	Careers Links These topics are used in careers such as computer programming, engineering, architecture, data science and scientific research, where professionals identify patterns, develop mathematical models and use algebra to predict and explain relationships. They develop logical reasoning, analytical thinking and problem-solving skills that are highly valued across STEM and technology-based careers.
P8. Listing & Describing	



Composites • Systematic Listing • Show that with probability • Exam-Style Problems	Key Vocabulary Probability The likelihood of an event happening. Show that To produce step-by-step working leading to a given conclusion.
Composites (Higher Only) • Product rule for counting	
How to help at home • Exam Practice - Past Papers OCR • Product Rule Video (Corbett Maths)	Careers Links These topics are used in careers such as data science, actuarial science, finance, computer science, logistics and scientific research, where professionals calculate probabilities, organise outcomes systematically and evaluate possible scenarios to support informed decision-making and risk assessment. They develop logical reasoning, analytical thinking and problem-solving skills that are valuable across a wide range of STEM and business careers.
N12. Numerical Reasoning	
Composites • Show that with number	Key Vocabulary Show that To produce step-by-step working leading to a given conclusion.
Composites (Higher Only) • Quadratic sequences • Calculating with bounds	
How to help at home • Exam Practice – Past Papers OCR • Quadratic Sequences Video (Corbett Maths) • Bounds Calculations Video (Corbett Maths)	Careers Links These topics are used in careers such as engineering, data science, finance, scientific research and quality assurance, where professionals identify patterns, model relationships, work with measurement accuracy and justify numerical conclusions using mathematical reasoning. They develop analytical thinking, precision and problem-solving skills that are essential across STEM and technical professions.



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Summer Term – Revision & Examinations