

Year 8 Mathematics

Mathematics is the study of topics such as quantity, structure, space and change. Year 7 pupils are encouraged to seek out patterns and use them to formulate new conjectures. The students then receive guidance on determining the veracity of these conjectures using mathematical proof. When mathematical structures are good models of real phenomena, then mathematical reasoning can provide insight or predictions about nature.

S Ward Head of Mathematics

Topic/Term	Term1: Number and Algebra
Key competencies (student abilities)	<ul style="list-style-type: none"> • Demonstrate a knowledge and understanding of facts, terms, concepts and conventions of mathematical language. • Demonstrate a knowledge and understanding of theories and techniques commonly applied to solve numeracy problems. • Present reasoned mathematical demonstration, understand implications and draw correct conclusion when dealing with ratio problems. • Apply their knowledge and understanding of facts, terms, concepts and conventions to fraction problems. • Distinguish between fraction, mixed number and percentages and apply their skills in context • Attain the basic skills in Algebra to continue to CORE IGCSE: • Identify like and unlike terms • Add algebraic terms • Multiply algebraic terms • Expand brackets • Simplify algebraic terms
Assessment	End of unit tests - Optional SATs
Links to CES learning Charter/IB learner profile	<p>- Independent learners</p> <p>During this term, the department will try to develop the independent learner within each student by helping them to manage their new learning environment in the best possible way. Homework deadlines, compartmentalisation and teaching styles have a big impact at this stage of the students' careers and this is a time when their independent learning needs to be strengthened.</p>

Topic/Term	Term 2: Graphs and Geometry
Key competencies (student abilities)	<ul style="list-style-type: none"> • Apply the idea of rate of change to easy kinematics involving distance-time and speed-time graphs, acceleration and deceleration; • Understand that equations in the form $y = mx+c$ represent a straight line and that m is the gradient and c is the value of the y-intercept; plot these graphs • Find the gradient and intercept from a given linear graph

	<ul style="list-style-type: none"> • What are the rules for angles on perpendicular lines ? • What do you know about a triangle in a circle that has one side as the diameter and one vertex on the circumference • What do you know about the angle formed at the tangent to a circle and a radius ? • What is the rule for the angles in a polygon? • What do you know about the interior angles in a regular polygon ? • What do you know about the exterior angles of a regular polygon ? • Explore simple properties of quadratic functions; plot graphs of simple quadratics • Identify and sketch graphs of linear and simple quadratic functions
Assessment	End of unit tests - Optional SATs
Links to CES learning Charter/IB learner profile	<p>- Reflective</p> <p>Not only is reflection a key skill in the learning profile, it is of immense value mathematically. Students need to look over the results of their conjectures and look back at their answers and continually apply a test of reasonableness to ask themselves if this are as expected and if they make sense. During this term, the department will work on this skill through metacognition and self regulation. Students will spend a lot of time looking back at competences and asking themselves: what was I learning? How did it go? What must I do next?</p>

Topic/Term	Term 3: Trigonometry, Measurement, Transformations and Statistics
Key competencies (student abilities)	<ul style="list-style-type: none"> • Apply Pythagoras' theorem • Find a missing angle in right angled triangle • Find a missing side in right angled triangle • Interpret and use three-figure bearings • Find perimeter, area, volume of given shapes • Use Pythagoras, trigonometry and measurement formulas to solve combined problems • Identify all the symmetries of 2-D shapes • Transform 2-D shapes by rotation, reflection and translation • Use of vectors to execute Translation • Understand and use the language and notation associated with enlargement; enlarge 2-D shapes, given a centre of enlargement and a positive integer scale factor; • Do and identify transformations using key information for each <p>Calculate statistics for small sets of discrete data:</p> <ul style="list-style-type: none"> • Calculate mode, median, mean, range • Calculate the mode, median and range, and the modal class for grouped data

	<ul style="list-style-type: none"> • Calculate the mean, including from a simple frequency table, using a calculator for a larger number of items <p>Construct graphs and diagrams to represent data, including:</p> <ul style="list-style-type: none"> • bar-line graphs • frequency diagrams for grouped discrete data • simple pie charts • Use and interpret a variety of graphs • Draw scatter graph and interpret • Have a basic understanding of correlation
Assessment	End of unit tests - Optional SATs
Links to CES learning Charter/IB learner profile	<ul style="list-style-type: none"> - Communicators <p>Communication is a huge part of mathematics, given that the subject is another language in and of itself. Students will present findings orally, in written form and through a variety of media.</p>

Examples of homework tasks	<ul style="list-style-type: none"> • www.myimaths.co.uk • Exercises from text books • Research tasks
Study equipment needed	<ul style="list-style-type: none"> - Calculator - Ruler - Compasses - Protractor
Useful websites	<ul style="list-style-type: none"> - www.myimaths.co.uk
Contact in school	sward@cesegypt.com