Stage 7 -Topic Programme of Study Objectives	Comment
Geometry and measures	
derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders)	
calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes	
draw and measure line segments and angles in geometric figures, including interpreting scale drawings	
derive and use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); recognise and use the perpendicular distance from a point to a line as the shortest distance to the line	
describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric	
use the standard conventions for labelling the sides and angles of triangle ABC, and know and use the criteria for congruence of triangles	
derive and illustrate properties of triangles, quadrilaterals, circles, and other plane figures [for example, equal lengths and angles] using appropriate language and technologies	
identify properties of, and describe the results of, translations, rotations and reflections applied to given figures	
identify and construct congruent triangles, and construct similar shapes by enlargement, with and without coordinate grids	
apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles	
understand and use the relationship between parallel lines and alternate and corresponding angles	
derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon, and to derive properties of regular polygons	
apply angle facts, triangle congruence, similarity and properties of quadrilaterals to derive results about angles and sides, including Pythagoras' Theorem, and use known results to obtain simple proofs	
use Pythagoras' Theorem and trigonometric ratios in similar triangles to solve problems involving right-angled triangles	
use the properties of faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres to solve problems in 3-D	
interpret mathematical relationships both algebraically and geometrically	

Probability	
record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale	
understand that the probabilities of all possible outcomes sum to 1	
enumerate sets and unions/intersections of sets systematically, using tables, grids and Venn diagrams	
generate theoretical sample spaces for single and combined events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities	

Statistics	
describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete, continuous and grouped data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers)	
construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data	
describe simple mathematical relationships between two variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs	