

# BGCSE SYLLABUS - CORE

Use the topics and details below to ensure you have covered the entire syllabus for the BGCSE Core Exam. Once you have practiced the skill enough that you are confident with the content, tick it off.



#	Topic	Details	✓
1	Number	a) Use real numbers, which include the natural numbers, integers, rational numbers and irrational numbers	
		b) Use prime numbers, common factors and multiples	
		c) Recognize the pattern in, and continue a given number sequence, and generalize the pattern to simple algebraic statements	
2	Set Notation and Language	a) Use language, notation and Venn diagrams to describe sets and represent relationship between sets as follows: <ol style="list-style-type: none"> <li>i. Roster eg. <math>A = \{1,3,5\}</math></li> <li>ii. Descriptive eg. <math>B = \{x:x \text{ is an integer}\}</math></li> <li>iii. Set Builder Notation eg. <math>C = \{x:a &lt; x &lt; b\}</math></li> </ol>	
		b) Solve problems involving sets using Venn diagrams	
3	Square, square root, cube and cube root	a) Calculate the square and cube, the square root and cube root of a number	
4	Directed Numbers	a) Use directed numbers in practical situations	
5	Vulgar (common) decimal fractions and percentages	a) Use the language and notation of simple vulgar (common) and decimal fractions and percentages in appropriate contexts	
		b) Recognize equivalence between these forms and convert from one to another	
6	Ordering (Comparing quantities)	a) Order quantities by magnitude using the appropriate symbols ( $=, \neq, <, >, \leq, \geq$ )	
7	Scientific Notation	a) Use scientific notation (Standard form) $A \times 10^n$ where $n$ is an integer and $1 \leq A < 10$ to perform the operations of addition, subtraction, multiplication and division	
8	The Four Rules	a) Use the four rules for calculations with whole numbers, vulgar (common) and decimal fractions	
		b) Use correct order of operations including the use of brackets	
9	Estimation	a) Make estimates of numbers, quantities and lengths	
		b) Give approximations to specified numbers of significant figures, decimal places and whole numbers	
		c) Give answers to reasonable accuracy in the context of the given problem	
10	Limits of accuracy	a) Give appropriate upper and lower bounds for data given to a specified accuracy (eg. Measured lengths)	
11	Ratio, proportion and rate	a) Demonstrate and understanding of the elementary ideas and notation of ratio, direct and inverse proportion and common measures of rate	
		b) Divide a quantity in a given ratio	
		c) Use scales in practical situations	
		d) Calculate average speed	

#	Topic	Details	✓
12	Percentages	a) Calculate a given percentage of a quantity	
		b) Express one quantity as a percentage of another	
		c) Calculate percentage increase or decrease	
13	Use of a calculator	a) Use a calculator efficiently	
		b) Apply appropriate checks of accuracy	
14	Measures	a) Use current units of mass, length, area, volume and capacity in practical situations	
		b) Express quantities in terms of larger or smaller units	
15	Time	a) Calculate time in terms of the 24 hour and 12 hour clock	
		b) Read clocks, dials and timetables	
16	Money, Personal and Household Finance	a) Solve problems using money and convert from one currency to another	
		b) Use given data to solve problems on personal and household finance involving earnings, simple interest, discount, profit and loss	
		c) Extract data from tables and charts	
17	Graphs in practical situations	a) Demonstrate familiarity with Cartesian coordinates in two dimensions	
		b) Interpret and use graphs in practical situations including travel and conversion graphs	
		c) Draw graphs from given data	
18	Graphs of functions	a) Construct tables of values for graphs of the form ( <i>where a and b are integral constants</i> ) i. $y = ax + b$ ii. $y = \frac{a}{x} \quad x \neq 0$	
		b) Draw and interpret such graphs	
		c) Find the gradient/slope of a straight line	
		d) Solve linear equations, approximately by graphical methods	
19	Equations of straight line graphs	No details	
20	Algebraic representation and formulae	a) Use letters to express generalized numbers and express basic arithmetic processes algebraically	
		b) Substitute letters for numbers and words in formulae	
		c) Transform simple formulae where the subject appears only once	
21	Algebraic manipulation	a) Manipulate brackets and extract common factors	
		b) Very simple algebraic fractions i. eg. $\frac{x}{2} + \frac{3x}{5}$ , $\frac{3a}{4} * \frac{5ab}{3}$ , $\frac{3a}{4} \div \frac{9a}{10}$	
22	Functions	No details	

#	Topic	Details	✓
23	Indices	a) Use and interpret $x^n$ where $x$ is a rational number and $n$ is an integer	
		b) Apply the rules of indices <ul style="list-style-type: none"> <li>i. <math>a^m * a^n = a^{m+n}</math></li> <li>ii. <math>a^m \div a^n = a^{m-n}</math></li> <li>iii. <math>(a^m)^n = a^{mn}</math></li> <li>iv. <math>a^0 = 1</math></li> <li>v. <math>a^{-n} = \frac{1}{a^n}</math></li> </ul>	
24	Algebraic equations	a) Solve very simple linear equations in one unknown	
		b) Solve simple linear equations with numerical denominators <ul style="list-style-type: none"> <li>i. eg. <math>\frac{x}{3} - \frac{3x}{4} = \frac{1}{12}</math></li> </ul>	
		c) Solve simultaneous linear equations in two unknowns	
25	Linear inequalities and regions	a) Solve simple linear inequalities	
		b) Show the solution on the number line	
26	Symmetry	a) Recognize rotational and line symmetry in two dimensions	
		b) Use properties of triangles, quadrilaterals and circles directly related to their symmetries	
27	Geometrical Terms and relationships	a) Use and interpret the geometrical terms: <ul style="list-style-type: none"> <li>i. Point, line, parallel, perpendicular,</li> <li>ii. Acute, right, obtuse, straight, reflex angle</li> <li>iii. Bearing, similarity, congruence</li> </ul>	
		b) Use and interpret vocabulary of triangle, quadrilateral, polygon, circle and simple solid figures including nets	
28	Geometrical construction	a) Measure lines and angles	
		b) Using pencil, ruler and compass only, construct a triangle given: <ul style="list-style-type: none"> <li>i. Three sides</li> <li>ii. Two angles and a contained side</li> <li>iii. Two sides and a contained angle</li> </ul>	
		c) Construct other simple geometrical figures from given data using protractors and set squares as necessary	
		d) Construct $30^\circ$ , $45^\circ$ , $60^\circ$ , $90^\circ$ angles, angle bisections and perpendicular bisectors using pencil, ruler and compasses only	
		e) Read and produce scale drawings	
29	Geometrical properties	a) Angles at a point	
		b) Angles formed with parallel lines	
		c) Angle properties of triangles, quadrilaterals and polygons in general	
		d) Angle and circle theorems <ul style="list-style-type: none"> <li>i. Angle in a semicircle</li> <li>ii. Angle between tangent and radius</li> </ul>	

#	Topic	Details	✓
30	Measurement	a) Solve problems involving <ol style="list-style-type: none"> <li>i. Perimeter and area of a:               <ol style="list-style-type: none"> <li>1. Rectangle</li> <li>2. Triangle</li> <li>3. Parallelogram</li> <li>4. Trapezium</li> </ol> </li> </ol>	
		ii. Circumference and area of a circle	
		iii. Volume of a: <ol style="list-style-type: none"> <li>1. Cylinder</li> <li>2. Cuboid</li> <li>3. Prism</li> </ol>	
31	Trigonometry	a) Interpret and use three-figure bearings	
		b) Apply Pythagoras' theorem and the <ol style="list-style-type: none"> <li>i. sine,</li> <li>ii. cosine,</li> <li>iii. tangent ratios</li> </ol> for acute angles to the calculation of a side or angle of a right-angled triangle	
32	Statistics	a) Collect, classify and tabulate statistical data	
		b) Read, interpret and draw simple inferences from tables and statistical diagrams	
		c) Construct and use bar charts, pie charts, pictograms, simple frequency distributions	
		d) Calculate the mean, median and mode for individual and discrete data and distinguish between the purposes for which they are used	
33	Probability	a) Calculate the probability of simple combined events, using probability spaces and tree diagrams where appropriate	
34	Vectors in two dimensions	a) Use the column matrix format to <ol style="list-style-type: none"> <li>i. Describe a vector on a plane (grid)</li> <li>ii. Draw a vector on a plane (grid)</li> <li>iii. Add two vectors</li> <li>iv. Multiply a vector by a scalar</li> </ol>	
35	Matrices	No details	
36	Transformations	a) Reflect simple plane figures in horizontal or vertical lines	
		b) Rotate simple plane figures about the origin through multiples of $90^\circ$	
		c) Enlarge simple plane figures through the origin with a scalar factor $n$ where $n$ is a natural number	
		d) Translate a simple plane figure given the column vector matrix of translations	
		e) Recognize and describe fully: reflections, rotations, enlargements and translations	
37	Differentiation	No details	