Mathematical skills required for GCSE biology B, chemistry C, Physics P and combined science CS

	Mathematical skills	Subject				GCSE Maths book	Pre_U Maths Edition 2	Step up to GCSE	Essential GCSE	Essential Pre-U Physics
1	**Arithmetic and numerical computation**									
a	Recognise and use expressions in decimal form	B	C	P	CS	5.1-5.11				
b	Recognise and use expressions in standard form	B	C	P	CS	10.1-10.16			examples in 2	examples in A3
c	Use ratios, fractions and percentages	B	C	P	CS	7.1-7.12; 4.1-4.15; 6.1-6.13				examples in A9
d	Make estimates of the results of simple calculations	B	C	P	CS	9.1-9.8				
2	**Handling data**									
a	Use an appropriate number of significant figures	B	C	P	CS	8.1-8.7				
b	Find arithmetic means	B	C	P	CS	examples in 55				
c	Construct and interpret frequency tables and diagrams, bar charts and histograms	B	C	P	CS	54.1-54.9; 56.1-56.8				
d	Understand the principles of sampling as applied to scientific data	B			CS					
e	Understand simple probability	B			CS	51.1-51.10; 52.1-52.10				
f	Understand the terms mean, mode and median	B		P	CS	55.1-55.11				
g	Use a scatter diagram to identify a correlation between two variables	B		P	CS	57.1-57.5				
h	Make order of magnitude calculations	B	C	P	CS	examples in 10				
3	**Algebra**									
a	Understand and use the symbols: =, <, <<, >>, >, ~, proportional to	B	C	P	CS	31.1-31.10; 34.1-34.13			examples in 7/7A	examples inn A10
b	Change the subject of an equation		C	P	CS	17.1-17.15; 18.1-18.6	A1.1, A1.2, A1.5, A1.6, A1.8 - A1.10	5.1-5.9	examples in 3	examples in A1
c	Substitute numerical values into algebraic equations using appropriate units for physical dimensions		C	P	CS	3.6-3.12; 11.1-11.12	A1.3, A1.4; E1.4, E1.5, E1.8, E1.9			examples in A1
d	Solve simple algebraic equations	B		P	CS	12.1-12.16; 23.1-23.14				
4	**Graphs**									
a	Translate information between graphical and numeric form	B	C	P	CS	examples in 24,25				
b	Understand that y=mx+c represents a linear relationship	B	C	P	CS	24.1-24.5			examples in 6	
c	Plot two variables from experimental or other data	B	C	P	CS					
d	Determine the slope and intercept of a linear graph	B	C	P	CS	24.1-24.17				examples in A5, A6
e	Draw and use the slope of a tangent to a curve as a measure of rate of change		C		CS	36.9-36.13				
f	Understand the physical significance of area between a curve and the x-axis and measure it by counting squares as appropriate			P	CS	36.9-36.13				examples in A7, A8
5	**Geometry and trigonometry**									
a	Use angular measures in degrees			P	CS	examples in 39, 40, 41?				
b	Visualise and represent 2D and 3D forms including 2D representations of 3D objects		C	P	CS	scale drawing in 45?				
c	Calculate areas of triangles and rectangles, surface areas and volumes of cubes	B	C	P	CS	43.1-43.11; 44.1-44.10				