

IFY Health & Science

Subjects Breakdown by Topic + Recommended Reading

Biology Topics

A Structure and Function of Biological Molecules: Water, Carbohydrates, Lipids, Proteins, Enzymes

B Organs, Tissues, Cellular Organisation and Cell Structure

C Cell Membrane Structure and Transport: Fluid Mosaic Model of Membrane, Osmosis, Facilitated and Active Transport, Transport of Larger Molecules

D Leaf structure, Water movement/Transpiration and Photosynthesis

E Respiration and Energy: Glycolysis/anaerobic respiration, Aerobic respiration

F Interpretation of scientific data and presentation of data

G DNA and Protein Synthesis: Outline of Chromosome Structure, The Structure of DNA, DNA and Protein Synthesis, Mutation

H The Cell Cycle and cellular replication: Replication of DNA , Mitosis, The cell cycle, Meiosis

I Mammalian Physiological Systems: Circulatory system, respiratory system, excretory system, Regulation of body fluids and ADH, Digestive system, Reproductive system,

J Genetics and genetic engineering: Patterns of inheritance, Consequences of mutation, Stem cells, Recombinant DNA, PCR.

Biology Recommended Reading

Core Text

Biology, Life on Earth with Physiology, Pearson New International Edition

Audeskirk, T Audeskirk, G and Bayers, B. E. (2013),
Pearson Education Ltd,
ISBN:1292026316/9781292026312

Further Reading

Advanced Biology (Principles and Applications)

C J Clegg (2000)
Hodder Education
ISBN: 0719576709/978-0719576706

Biological Science 1 and 2 (v 3)

D.J.Taylor, N.P.O. Green, G.W. Stout, R. Soper
Cambridge University Press;
ISBN: 0521561787/978-0521561785

Understanding Biology for Advanced level

Toole and Toole (1999)
Nelson Thornes
ISBN: 0748739572/978-0748739578

Biology 10th Ed.

N.A. Campbell, J.B. Reece, L. Urry (2014)
Pearson
ISBN: 1292008652/ 978-1292008653

Useful Websites	https://www.khanacademy.org/science/biology Site offering a range of teaching and learning resources
	http://www.biologycorner.com Site offering a range of teaching and learning resources covering many aspects of the syllabus.
	http://www.educationscotland.gov.uk/highersciences/biology/index.asp Site offering a range of teaching and learning resources
	http://www.yourgenome.org Information and resources looking at DNA and Genetics
	http://www.johnkyrk.com Site offering a range of teaching and learning resources covering cell Biology
	http://www.saps.plantsci.cam.ac.uk Web resources on plant biology. Offers a range of student sheets, teacher resources and technical notes.
	www.i-biology.net Website offering student resources across a range of biology topics.

Chemistry Topics

- A Atomic Structure and Atomic Mass
- B Electronic Structure of Atoms, and the Periodic Table
- C Intramolecular Chemical Bonding – Ionic, Covalent, Metallic and Dative
- D Transition Metal
- E Intermolecular Bonding – van der Waal, Dipole-Dipole, Hydrogen, Shapes of Molecules, Macromolecular Structures
- F Quantitative Analysis in Gases and Solutions
- G Empirical and Molecular Formulae, Oxidation and Reduction
- H The Periodic Table
- I Group II
- J Group VII
- K Organic Chemistry: Nomenclature, Isomerism and Bond Fission
- L Alkanes and Alkenes
- M Alcohols, Carboxylic Acids and Esters
- N Halogenoalkanes to Illustrate Nucleophilic Substitution (SN1 and SN2) Reaction Mechanisms
- O Aldehydes and ketones
- P Aromatic Chemistry
- Q Chemical Energetics

R Kinetics

S Equilibrium Constants, K_c and K_p

T Bronsted-Lowry Theory of Acids and Bases

U Spectroscopy

Chemistry Recommended Reading

Core Text	<i>Rob Lewis and Wynn Evans (2011) Chemistry 4th ed., Palgrave Macmillan, ISBN: 0230291821/ 9780230291829.</i> <i>Covers all but a few of the more advanced topics (e.g. S_N1, S_N2, nucleophiles).</i>
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Further Reading	A large number of texts are available to supplement the recommended book. The following book covers most of the syllabus:
	<i>Michael Lewis (2005) Advanced Chemistry through Diagrams 2nd ed., Oxford University Press ISBN: 019915077X/ 978-0199150779.</i>
	E.N. Ramsden (2000) <i>A-level Chemistry 4th ed.</i> , Stanley Thornes, ISBN 0748752994/ 9780748752997
	Two books which contain material on organic chemistry reactions and may be useful are: R J Ouellette (1997), <i>Organic Chemistry: a brief introduction, 2nd ed.</i> , Prentice Hall, ISBN: 9780138419332/ 0138419337. (Out of print, though second hand copies may be available from some retailers.) G L Patrick (1997) <i>Beginning Organic Chemistry 2: Book 2 (Workbooks in Chemistry series)</i> , Oxford University Press, ISBN: 19970198559364/ 9780198559368. The topic of organic reaction mechanisms is covered in these, including S_N1 , S_N2 and nucleophiles generally. The second book contains a mass of detail and may be better used as a sourcebook for the teacher.

Useful Websites	The Royal Society of Chemistry website www.rsc.org is a good starting point for a range of online resources. Many of these are aimed at university level but with teacher guidance students could find them useful.
Recommended Referencing Guide	Pears, R. and Shields, G. (2013) <i>Cite them right: the essential referencing guide</i> . 9 th edn. Basingstoke: Palgrave Macmillan. ISBN: 9781137273116. There are online guides based on this publication. Centres may consider subscribing to the online version at http://www.citethemrightonline.com . An older 2005 edition of the book can be downloaded (free) from http://www.angelfire.com/planet/ibm2007/cite_them_right.pdf

Maths for Science Topics

- A Linear Equations
- B Simple probability
- C Quadratic Equations, inequalities and Remainder Theorem
- D Binomial Expansions, Sequences and Series
- E Indices, Exponential and Logarithmic Functions
- F Trigonometric Functions
- G Calculus – differentiation
- H Calculus – integration
- I Further Differentiation
- J Further Integration
- K Statistical Methods
- L Statistical Distributions

Maths for Science Recommended Reading

Core Text

D Rayner and P Williams (2004), *Pure Maths C1 C2*, Elmwood Press, ISBN: 1902214455/978-1902214450

D Rayner and P Williams (2005), *Pure Maths C3 C4*, Elmwood Press, ISBN: 1902214463/978-1902214467

Keith Pledger et al (2009), *AS and A Level Modular Mathematics - Statistics 1*, Pearson Education, ISBN: 9780435519308

Further Reading

R Emanuel & J Wood. (2005) *Advanced Mathematics AS Core for Edexcel*. Longman ISBN 0-582-84237-9. This text book also includes a self-study CD, ISBN: 0582842379 / 9780582842373.

L Bostock and S Chandler (2000), *Core Maths for A-level*, 3rd edition, Stanley Thornes, ISBN: 0748755098 / 9780748755097

Crawshaw and Chambers (2000), *A Concise Course in A-Level Statistics*, ISBN: 074875475X / 9780748754755.

AJ Sadler and DWS Thorning (1995), *Understanding Pure Mathematics*, OUP, ISBN: 0199142599 / 9780199142590. ONLY AVAILABLE SECOND HAND

Useful Websites http://www.revision-notes.co.uk/A_Level/Maths/

<http://maxima.sourceforge.net> for a copy of the
mathematical program Maxima

<http://www.geogebra.org> for a copy of the mathematical
program GeoGebra