International® Baccalaureate

Diploma Programme
Biology: summary of changes

September 2007

Biology: summary of changes

The new group 4 guides were sent to schools in March 2007 for first examinations in May 2009.

This document is designed to help teachers of the previous course (published 2001) to follow the changes in the biology syllabus. It should be read in conjunction with the new *Biology guide* and not as an alternative to it.

The following table provides an overview of the biology syllabus, indicating where the content has changed significantly with the introduction of new assessment statements (AS), movement of assessment statements between sections of the syllabus or rewording of previous assessment statements.

Comments on syllabus changes are in italics and in red.

CORE		AHL MATERIAL		OPTIONS AT SL		OPTIONS AT HL	
Topic/ Sub-topic	Description/hours	Topic/ Sub-topic	Description/hours	Topic/ Sub-topic	Description/hours (Study 2 options out of 7)	Topic/ Sub-topic	Description/hours (Study 2 options out of 5)
1	Statistical analysis—2 hours *Completely new topic* *Help with IA dealing with error and uncertainties*						
2	Cells—12 hours						
2.1	Cell theory—3 hours *(some of previous topic 1.1)*						
2.2	Prokaryotic cells—1 hour *(mostly previous topic 1.2)*			F	Microbes and biotechnology—15 hours *(mostly rewritten)*	F	Microbes and biotechnology—22 hours *(mostly rewritten)*
2.3	Eukaryotic cells—3 hours *(mostly previous topic 1.3)*			F1	Diversity of microbes—5 hours *(all new)*	F1	Diversity of microbes—5 hours *(all new)*
2.4	Membranes—3 hours *(previous topic 1.4 with minor changes to some command terms)*						
2.5	Cell division—2 hours *(previous topic 1.5 with minor changes to some command terms)*						

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3	The chemistry of life—15 hours	7	Nucleic acids and proteins—11 hours	C	Cells and energy—15 hours *(taken from AHL)*		
3.1	Chemical elements and water—2 hours *(previous topic 2.1 with minor changes to some command terms and reduction in number of AS)*						
3.2	Carbohydrates, lipids and proteins—2 hours *(previous topic 2.2 with minor changes to some command terms and reduction in number of AS)*	7.5	Proteins—1 hour *(previous topic 6.5)*	C1	Proteins—1 hour *(previous topic C.1)*		
3.3	DNA structure—1 hour *(previous topic 2.4)*	7.1	DNA structure—2 hours *(previous topic 6.1 with addition of two new A.S)*	C2	Enzymes—2 hours *(previous topic C.2 with addition of two new A.S)*		
3.4	DNA replication—1 hour *(previous topic 2.5)*	7.2	DNA replication—2 hours *(previous topic 6.2)*				
3.5	Transcription and translation—2 hours *(previous topic 2.6)*	7.3	Transcription—2 hours *(previous topic 6.3 with a reduction in number of AS)*				
		7.4	Translation—2 hours *(previous topic 6.4 with previous AS 2.2.6)*				
3.6	Enzymes—2 hours *(mostly previous topic 2.3)*	7.6	Enzymes—2 hours *(previous topic 6.6)*				

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		8	Cell respiration and photosynthesis—10 hours				
3.7	Cell respiration—2 hours *(mostly previous topic 2.7)*	8.1	Cell respiration—5 hours *(previous topic 7.1)*	C3	Cell respiration—6 hours *(previous topic C.3)*		
3.8	Photosynthesis—3 hours *(previous topic 2.8)*	8.2	Photosynthesis—5 hours *(previous topic 7.2)*	C4	Photosynthesis—6 hours *(previous topic C.4)*		
		9	Plant science—11 hours				
		9.1	Plant structure and growth—4 hours *(some previous topic 13.1 with new AS)*				
		9.2	Transport in angiospermophytes—4 hours *(mostly previous topic 13.2)*				
		9.3	Reproduction in angiospermophytes—3 hours *(mostly previous topic 13.3)*				
4	Genetics—15 hours	10	Genetics—6 hours				
4.1	Chromosomes, genes, alleles and mutations—2 hours *(previous topic 3.1 with reduction in number of AS)*						
4.2	Meiosis—3 hours *(mostly previous topic 3.2 with karyotyping added)*	10.1	Meiosis—2 hours *(previous topic 8.1 with removal of recombination)*				

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4.3	Theoretical genetics—5 hours *(previous topic 3.3 with minor changes to some command terms)*	10.2 10.3	Dihybrid crosses and gene linkage—3 hours *(amalgamation of previous topics 8.2 and 8.3, removal of Chi-squared test)* Polygenic inheritance—1 hour *(previous topic 8.4)*				
4.4	Genetic engineering and biotechnology—5 hours *(previous topic 3.4 with minor changes to some command terms and reduction in number of AS)*			F	Microbes and biotechnology—15 hours *(mostly rewritten)*	F	Microbes and biotechnology—22 hours *(mostly rewritten)*
				F3	Microbes and biotechnology—3 hours *(mostly new; includes previous AS 6.3.6/6.3.7)*	F3	Microbes and biotechnology—3 hours *(mostly new; includes previous AS 6.3.6/6.3.7)*
5	Ecology and evolution—16 hours			F	Microbes and biotechnology—15 hours *(mostly rewritten)*	F	Microbes and biotechnology—22 hours *(mostly rewritten)*
5.1	Communities and ecosystems—5 hours *(mostly previous topic 4.1 with minor changes to some command terms)*			F2	Microbes and the environment—4 hours *(some new AS with previous G.4.5/5.7/5.8 and AS similar to G.4.6/4.7/5.5)*	F2 F5	Microbes and the environment—4 hours *(some new AS with previous G.4.5/5.7/5.8 and AS similar to G.4.6/4.7/5.5)* Metabolism of microbes—2 hours *(all new)*

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5.2	The greenhouse effect—3 hours *(AS from previous topics 4.1 and 4.5, introduction of "precautionary principle")*			F2	Microbes and the environment—4 hours *(some new AS with previous G.4.5/5.7/5.8 and AS similar to G.4.6/4.7/5.5, the nitrogen cycle)*	F2	Microbes and the environment—4 hours *(some new AS with previous G.4.5/5.7/5.8 and AS similar to G.4.6/4.7/5.5, the nitrogen cycle)*
				G	Ecology and conservation—15 hours	G	Ecology and conservation—22 hours
				G1	Community ecology—5 hours *(some previous G.1 and G.2.2; some aspects of sampling from previous topic 4.2.8 moved here)*	G1	Community ecology—5 hours *(some previous G.1 and G.2 2 some aspects of sampling from previous topic 4.2.8 moved here)*
				G2	Ecosystems and biomes—4 hours *(mostly previous G.2 with minor changes to some command terms and some new AS)*	G2	Ecosystems and biomes—4 hours *(mostly previous G.2 with minor changes to some command terms and some new AS)*
				G3	Impacts of humans on ecosystems—6 hours *(some previous G.3 and G.5; some new AS which focus on effects of introducing alien species and consequences of biomagnification)*	G3	Impacts of humans on ecosystems—6 hours *(some previous G.3 and G.5; some new AS which focus on effects of introducing alien species and consequences of biomagnification)*
						G4	Conservation of biodiversity—3 hours *(mostly previous G.3 with minor changes to some command terms)*

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5.3	Populations—2 hours *(some from previous topic 4.2; a large reduction in number of AS; standard deviation moved to topic 1; previous AS 4.2.7 moved to new G5)*					G5	Population ecology—4 hours *(mostly new; includes previous AS 4.2.7and G.3.6)*
				D	Evolution—15 hours	D	Evolution—22 hours
5.4	Evolution—3 hours *(mostly previous topic 4.3 and AS similar to previous D.3)*			D1	Origin of life on Earth—4 hours *(mostly new with some previous D.1)*	D1	Origin of life on Earth—4 hours *(mostly new with some previous D.1)*
				D2	Species and speciation—5 hours *(mostly new, some previous AS D.5.4/5.7/5.8/5.9/6.6)*	D2	Species and speciation—5 hours *(mostly new; some previous AS D.5.4/5.7/5.8/5.9/6.6)*
				D3	Human evolution—6 hours *(amalgamation of some previous D.3 and D.4; overall reduction of AS)*	D3	Human evolution—6 hours *(amalgamation of some previous D.3 and D.4; overall reduction of AS)*
						D4	The Hardy–Weinberg principle—2 hours *(mostly reduction of previous D.6)*
						D5	Phylogeny and systematics—5 hours *(extension of AS introduced in previous D.3)*

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5.5	Classification—3 hours *(some of previous topic 4.4 and AS similar to previous 13.1.1)*			F	Microbes and biotechnology—15 hours *(mostly rewritten)*	F	Microbes and biotechnology—22 hours *(mostly rewritten)*
				F1	Diversity of microbes—5 hours *(all new)*	F1	Diversity of microbes—5 hours *(all new)*
6	Human health and physiology—20 hours					H	Further human physiology—22 hours *(previous option H with minor changes to some command terms and some reduction in AS)*
				F	Microbes and biotechnology—15 hours *(mostly rewritten)*	F	Microbes and biotechnology—22 hours *(mostly rewritten)*
6.1	Digestion—3 hours *(previous topic 5.1)*			F4	Microbes and food production—3 hours *(all new)*	F4	Microbes and food production—3 hours *(all new)*
				A	Human nutrition and health—15 hours *(some previous AS but mostly new to allow focus on current issues in nutrition)*		
				A1	Components of the human diet—5 hours		
				A2	Energy in human diets—4 hours		
				A3	Special issues in human nutrition—6 hours		

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						H2	Digestion—4 hours
						H3	Absorption of digested foods—2 hours
						H4	Functions of the liver—3 hours
6.2	The transport system—3 hours *(previous topic 5.2 small reduction in AS)*			B	Physiology of exercise—15 hours	H5	The transport system—5 hours
				B3	Training and the cardiovascular system—3 hours *(new AS)*		
6.3	Defence against infectious disease—3 hours *(amalgamation of previous topics 5.3 and 5.4; transmission of bacterial diseases and methods of entry moved to F6)*	11	Human health and physiology—17 hours				
		11.1	Defence against infectious disease—4 hours *(previous topic 10.1 with definition of types of immunity simplified)*				
6.4	Gas exchange—2 hours *(previous topic 5.5 with minor changes to some command terms)*			B2	Training and the pulmonary system—2 hours *(new AS)*	H6	Gas exchange—5 hours
				B4	Exercise and respiration—3 hours *(mostly new AS, some previous B.3)*		
6.5	Nerves, hormones and homeostasis—6 hours *(amalgamation of previous topic 5.6 and topic 11.1 which*	11.2	Muscles and movement—4 hours *(these are identical, amalgamation of previous topic 11.2 and B.1, previous B.1.9 becomes B.5.3)*	B1	Muscles and movement—4 hours		

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	refocuses this sub-topic; it can be built upon in option B)			B5	Fitness and training—2 hours *(new AS)*		
				B6	Injuries—1 hour *(previous B.5)*		
		11.3	The kidney—4 hours *(mostly previous topic 12.2)*			H1	Hormonal control—3 hours
				E	Neurobiology and behaviour—15 hours	E	Neurobiology and behaviour—22 hours
				E1	Stimulus and response—2 hours *(mostly new AS)*	E1	Stimulus and response—2 hours *(mostly new AS)*
				E2	Perception of stimuli—4 hours *(mostly previous E.2 with minor changes to some command terms; introduction of the ear)*	E2	Perception of stimuli—4 hours *(mostly previous E.2 with minor changes to some command terms; introduction of the ear)*
				E3	Innate and learned behaviour—4 hours *(some previous AS from E.3 and E.4 but mostly new AS to focus on modern functional studies)*	E3	Innate and learned behaviour—4 hours *(some previous AS from E.3 and E.4 but mostly new AS to focus on modern functional studies)*
				E4	Neurotransmitters and synapses—5 hours *(some previous E.7 with minor changes to some command terms to scale down some of the AS)*	E4	Neurotransmitters and synapses—5 hours *(some previous E.7 with minor changes to some command terms to scale down some of the AS)*

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						E5	The human brain—4 hours *(mostly previous E.3 relating to the brain with introduction of new experimental techniques to investigate brain activity)*
						E6	Further studies of behaviour—3 hours *(some previous E.5 and new examples of animal behaviours)*
						H	Further human physiology—22 hours *(previous option H with minor changes to some command terms and some reduction in AS)*
6.6	Reproduction—3 hours *(mostly previous topic 5.7 with reduction of AS)*	11.4	Reproduction—5 hours *(previous topic 9 and some AS from previous topic 5.7)*			H1	Hormonal control—3 hours