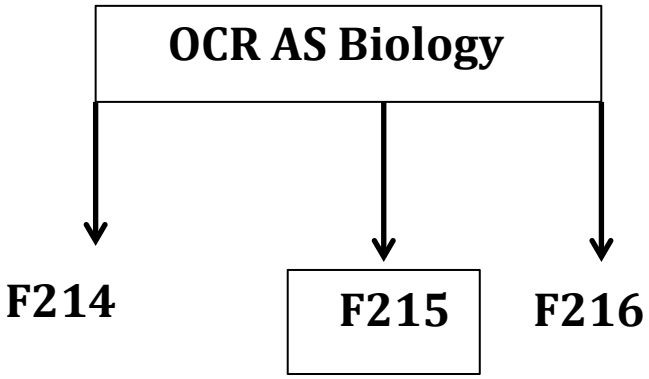
OCR A2 GCE Biology A (H421)



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Unit F215: Control, genomes and environment	Paper code: F215 QP
1. Exam paper- Unit F215: Control, Genomes and Environment 17th June 2015 – 2 hours	25 % of Advanced GCE Biology

Overview of content

1. Module 1: Cellular Control and Variation
2. Module 2: Biotechnology and Gene Technologies
3. Module 3: Ecosystems and Sustainability
4. Module 4: Responding to the environment

Overview of assessment

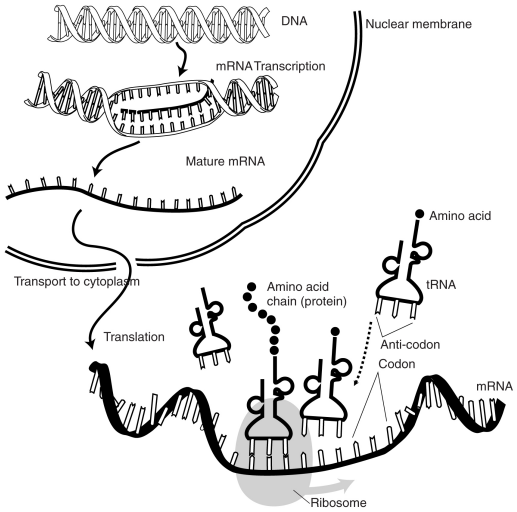
1. The unit is assessed through a 2-hour examination paper set and marked by OCR.
2. The total number of marks is 100.
3. Grades A*–E are available.
4. Grades assessment by year:

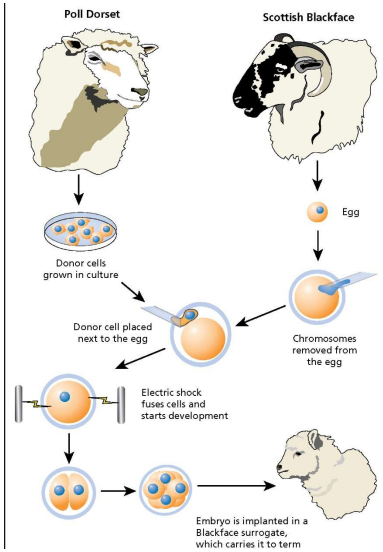
Year	Raw Marks to 90 % UMS - A*	Raw Marks to 80 % UMS grade 'A'
Jan 2010	-	-
Jun 2010	71	65
Jan 2011	66	60
Jun 2011	69	63
Jan 2012	74	68
Jun 2012	73	67
Jan 2013	83	77
Jun 2013	70	64
Jun 2014	69	63
Jun 2015	?	?

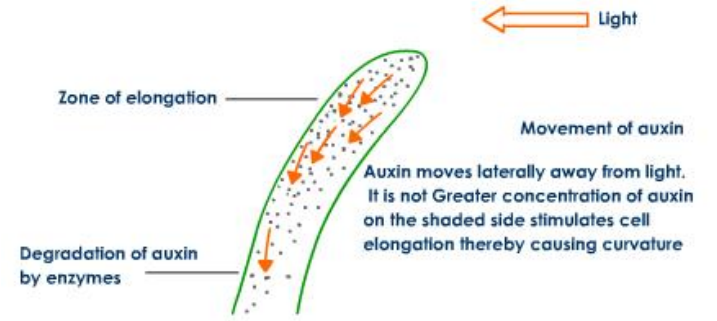
OCR A2 GCE Biology A-level

A2 unit F215: Control, Genomes and Environment

- **Module 1: *Cellular Control and Variation***
  - **Cellular Control**
  - **Meiosis**
- **Module 2: Biotechnology**
  - **Cloning**
  - **Biotechnology**
- **Module 3 Ecosystems and sustainability**
  - **Ecosystems**
  - **Sustainability**
- **Module 4 Responses**
  - **Plant responses & animal responses + behaviour**







Hypothesis for effect of unilateral illumination on distribution of auxin in a coleoptile

How BioChem Tuition prepares their students for F215: *Control, Genomes and Environment?*

BioChem Tuition has a three-pronged strategy to attack F215 that helps students attain A or A*.

1. **Detailed F215 knowledge:** The students will study the specification of OCR F215 alongside extensive practice of examination style questions to help them retain the content of the specification. The students will receive detailed F215 notes prepared by BioChem Tuition. This is supplemented by examination style questions to gauge the student's level of understanding of the topic.

Key features

- ✓ F215 specification notes.
- ✓ F215 examination style past examination questions.
- ✓ 1-2-1 help in understanding the key examiner points.
- ✓ Revision notes and charts to aid revision.

2. **Practice OCR past examination papers (2001-2014):** All students will complete at least 14 years of OCR past exam papers. BioChem Tuition will provide all the past papers in printed form to the students. Candidates are required to complete past papers, which are checked and marked in light of the official examiner report and mark scheme in the presence of the student. Any mistakes will be followed up to ensure the mistakes are not repeated. The students will be shown how to maximise their marks by following our exam technique and also methods to improve comprehension for scientific questions.

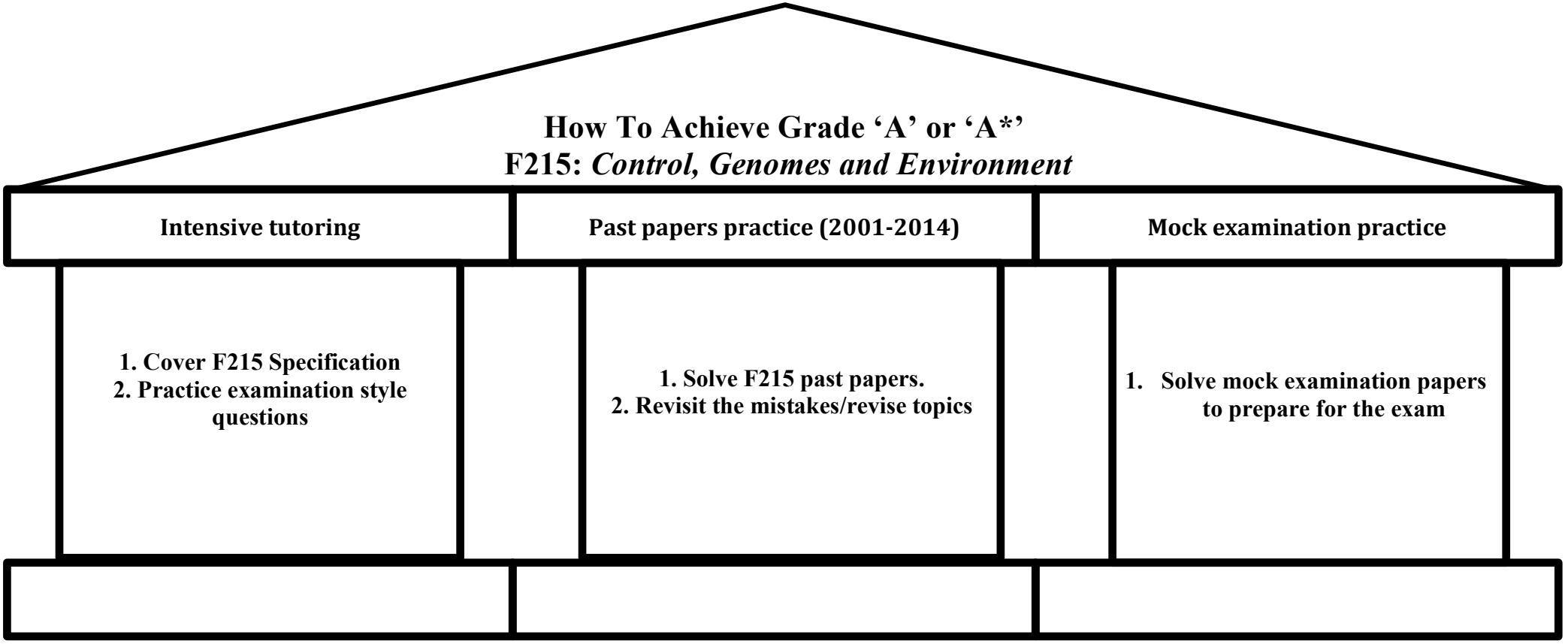
Key features

- ✓ 14 years of past examination papers practice.
- ✓ 1-2-1 help in understanding the exam technique.
- ✓ Revisit the mistakes and practice relevant questions to ensure the mistakes are not repeated.
- ✓ Past paper practice can be extended by solving F215 style questions from AQA, CIE and Edexcel exam boards.

3. **Mock examination practice:** Mock F215 examination practice to give student feedback on the likely grade achievable in the exams.

Key features

- ✓ Mock examination practice to simulate exam experience, which will be marked, graded and feedback on mistakes provided.


How To Achieve Grade 'A' or 'A*'
F215: Control, Genomes and Environment
Intensive tutoring
Past papers practice (2001-2014)
Mock examination practice
1. Cover F215 Specification
2. Practice examination style questions
1. Solve F215 past papers.
2. Revisit the mistakes/revise topics
1. Solve mock examination papers to prepare for the exam

F215 Tuition Plan

Tuition Plan for F215: *Control, Genomes and Environment*	
Stage 1: Specification Topics	**Tuition time**
Module 1: *Cellular Control and Variation*	**12 hours**
Module 1: Cellular Control and Variation • Genetic code, Transcription and Translation. • Mutations, *Lac* operon, Homeobox genes and Apoptosis. • Meiosis, genetic basis of variation in Meiosis, genetic diagrams, epistasis (dominant/recessive and complementary), chi-square test • Variation (continuous and discontinuous), Hardy-Weinberg principle. • Stabilizing and evolutionary forces of selection and genetic drift. • Speciation (sympatric and allopatric) along with the roles of isolating mechanisms. • Natural and artificial selection – modern dairy cow and production of bread wheat.	**6 hour**
• Practice of past examination style questions on **Cellular Control and Variation**	**6 hours**
Module 2: *Biotechnology and Gene Technologies*	**12 hours**
2.1 Cloning, Biotechnology and Genomes • Cloning in plants (vegetative propagation) and plant tissue culture. • Cloning in animals and therapeutic cloning. • Biotechnology – use of microorganisms, immobilizing enzymes, continuous and batch culture, manipulating the growth conditions in fermentation culture and the importance of asepsis culture. • Sequencing genome, recombinant gene technology, PCR and electrophoresis and gene probes. • Transgenic bacteria to produce insulin and golden rice.	**6 hours**

Practice of past examination style questions on **Biotechnology and Gene technologies**	**6 hours**

Module 3: *Ecosystems and Sustainability*	**20 hours**
3.1 Ecosystems • Ecosystems and dynamic equilibrium in natural systems. • Biotic/abiotic factors, producer, consumer, decomposer and trophic levels. • Energy transfer through ecosystems and efficiency of energy transfer. • Succession and climax community • Sampling and nitrogen cycle.	**4 hours**
3.2 Population and Sustainability • Limiting factors of population. • Carrying capacity and competition between species. • Conservation and dynamic process of conservation. • The effect of human activities on populations	
Module 4: Responding to the environment	
• Plant responses – Tropism, plant growth hormones and commercial plant hormones. • Animal responses – peripheral/central nervous systems, brain structure and function. • Muscular contraction – sliding filament model • Compare different types of muscle and flight and fight response in mammals. • Animal behavior - innate, reflex, taxes/kinesis. • Learned behavior – habituation, imprinting, classical/operant conditioning, late and insight learning. • Social behavior in mammals and DRD4 gene and relation to behavior in humans.	**6 hours**
Practice of past examination style questions on **ecosystems and sustainability and responding to the environment.**	**10 hours**

Stage 2: *Past paper practice*	**10 hours**
• Practice of past examination papers from 2001 to 2014 relevant to **F215: Control, Genomes and Environment.** ✓ 14 years of past examination papers practice. ✓ 1-2-1 help in understanding the exam technique. ✓ Revisit the mistakes and practice relevant questions to ensure the mistakes are not repeated. ✓ Past paper practice can be extended by solving F215 style questions from other exam boards such as AQA, CIE and Edexcel.	10 hours