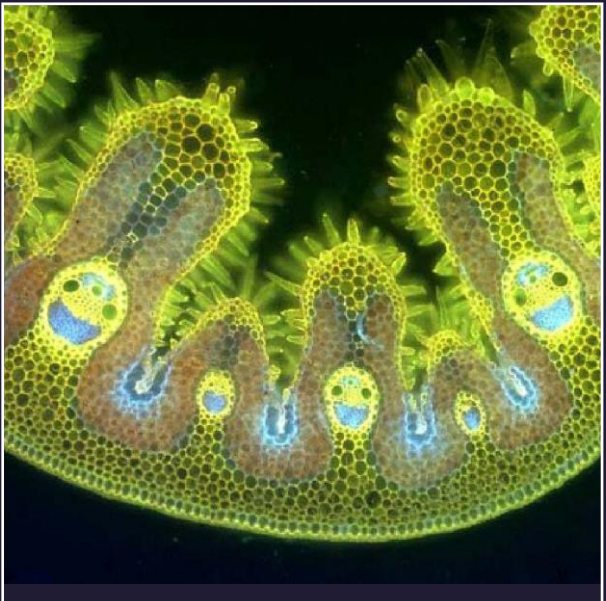




THE LADY  
ELIZABETH  
SCHOOL



Biology @LES



Exploring Life

# AS/A2 INTERNATIONAL ADVANCED LEVEL BIOLOGY

EXAMINATION BOARD: Edexcel

LEVEL: AS AND A2 EXAM

TIMING:

January, June and October

## WHAT DO I NEED TO KNOW, OR BE ABLE TO DO, BEFORE TAKING THIS COURSE?

The qualification builds on the knowledge, understanding and practical skills that you gained in IGCSE Science, IGCSE Additional Science or IGCSE Biology (Minimum Grade 5). You should also have at least a grade 5 in IGCSE Mathematics, as numerical and mathematical skills are important in Biology. IGCSE Chemistry is also very useful but not a requirement. You will also need to be able to communicate effectively, be able to plan and carry out research and think critically about problems.

## WHAT WILL I LEARN?

In Biology you will develop practical skills by planning experiments, collecting data, analysing experimental results and making conclusions. You will also learn how scientific models are developed, the applications and implications of science, the benefits and risks that science brings and the ways in which society uses science to make decisions.

### UNIT 1: Molecule, Diet, Transport and Health

This unit includes a consideration of molecules that are important in biology – including water, carbohydrates, lipids, proteins and nucleic acids, providing a basis for many areas of biology. This leads to the relevance of diet to health and the cardiovascular system in particular. The unit includes cell membrane transport processes, such as diffusion and active transport, proteins, enzymes and protein synthesis. This unit also includes an understanding of the genetic code and how mutations can result in disorders. Students will also consider techniques for genetic screening and the associated ethical and social issues

### UNIT 2: Cells, Development, Biodiversity and Conservation

This unit starts with the cell as the basic unit of all living organisms, leading to cell division, formation of gametes,

fertilisation and the continuity of life. The roles of stem cells, gene expression, and the influence of the environment and epigenetics on phenotypes are also included. Cell development leads to an understanding of the structure and functions of plant cells, and how plants may be exploited by humans for fibres and as sources of drugs. This unit also considers the diversity of life and how biodiversity can be measured. The unit ends with an account of reasons for changes in populations over time, and the methods used by zoos and seed banks for the conservation of endangered species and their genetic diversity.

## UNIT 4: Energy, Environment, Microbiology and Immunity

This unit begins with energy capture in photosynthesis and the synthesis of organic compounds by plants, and the flow of energy in ecosystems. This is followed by a consideration of the carbon cycle and how disruption of this cycle may lead to climate change. Students will also consider changes that occur in populations, both in the short term and long term, as a result of mutation and natural selection. The unit continues with an introduction to the diversity and features of microorganisms and how hosts respond to infection by pathogens. This leads to a consideration of the role of microorganisms in decomposition of organic materials and the techniques and applications of polymerase chain reaction (PCR) and gel electrophoresis.

## UNIT 5: Respiration, Internal Environment, Coordination and Gene Technology

Following on from energy and the environment in Unit 4, this unit starts by considering energy within organisms and how energy is made available for processes, including muscle contraction. There are further details of some of the topics in AS, including coordination of the heartbeat. Students will also consider some aspects of maintenance of the internal environment, with specific references to kidney function and the mode of action of hormones. This leads on to the topic of coordination in mammals and in flowering plants, the effects of drugs on the nervous system and how modern techniques of gene technology are used for the production of drugs. Modern aspects of gene technology, including the use of microarrays, provide a foundation for further study in this area.

### HOW WILL I BE ASSESSED?

#### ASSESSMENT AT AS LEVEL

Units 1 and 2 are externally assessed written examination papers, each lasting 90 minutes. The papers will contain short and longer questions, multiple choice and some calculations. Unit 3 is externally assessed and is an exam that replaces the practical exam. These will all be sat in June of Year 12.

## ASSESSMENT AT A2 LEVEL

Units 4 and 5 are externally assessed written examination papers, each lasting 1 hour 45 minutes. The papers will contain short longer questions, multiple choice and some calculations. There is pre-released reading for Unit 5. Unit 6 is externally assessed and is an exam that replaces the practical exam. This lasts 1 hour 20 minutes

Unit 4 will be sat in January of Year 13. Units 5 & 6 are sat for in June of Year 13. There is also the opportunity to re-sit Units 1 to 4 once during Year 13 is necessary.

## IS THIS THE RIGHT SUBJECT FOR ME?

### AS AND A LEVEL BIOLOGY IS SUITABLE IF YOU:

- have an interest in, and enjoy Biology and want to find out about how things work in the biological world by application of imaginative, logical thinking
- want to use Biology to progress onto further studies in Higher Education or support other qualifications or enter Biology-based employment
- are taking A levels in the other sciences and/or mathematics or other relevant courses such as Physical Education and want to take another course that will support those studies.

It also provides the opportunity to develop a wide range of transferable skills that can provide access to many different career areas.

## WHAT CAN I DO AFTER I'VE COMPLETED THE COURSE?

Biology leads on to a wide range of courses and careers. This could include:

- an undergraduate degree in a life sciences, medicine, environmental science, forensic science and related courses or a BTEC Higher National (HNC and HND)
- employment - for example in the areas of biological testing, biotechnology, independent research and the food industry.

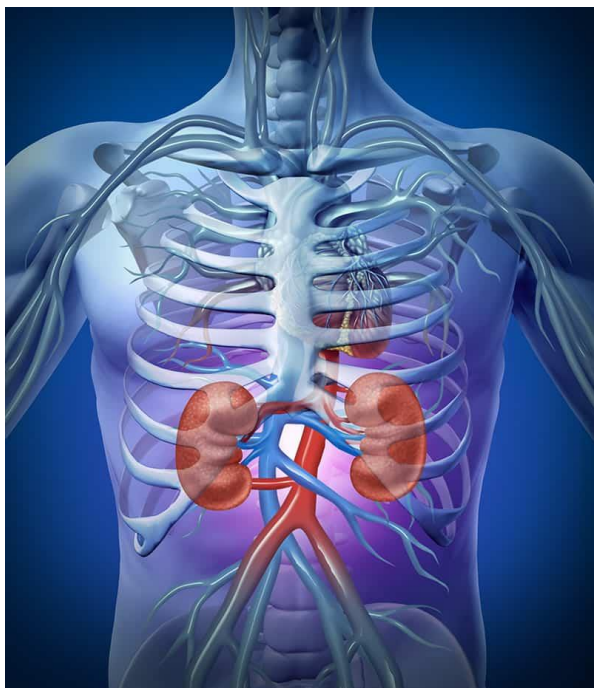
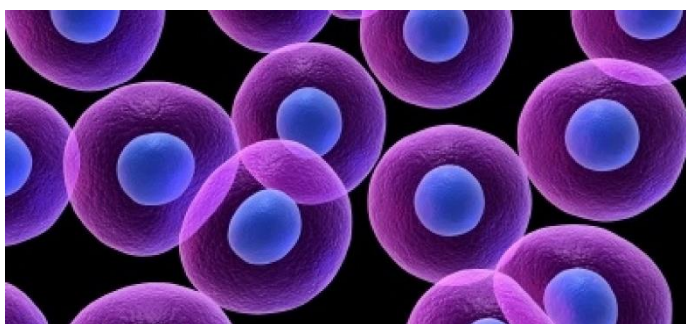
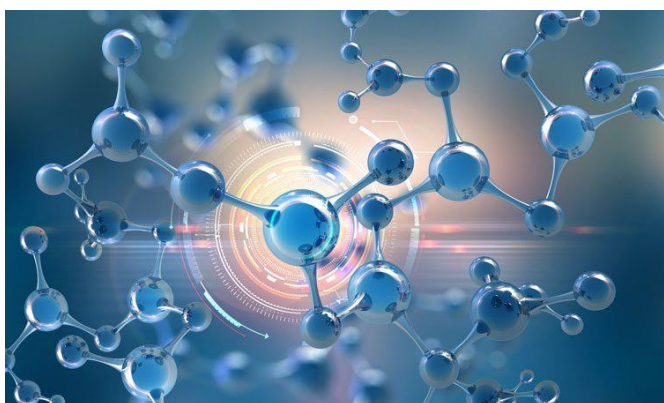
To find out more talk to your Biology teacher and visit your careers office or [www.iob.org](http://www.iob.org) for further information on careers and courses in Biology. For the full specification check [www.edexcel.org.uk](http://www.edexcel.org.uk).

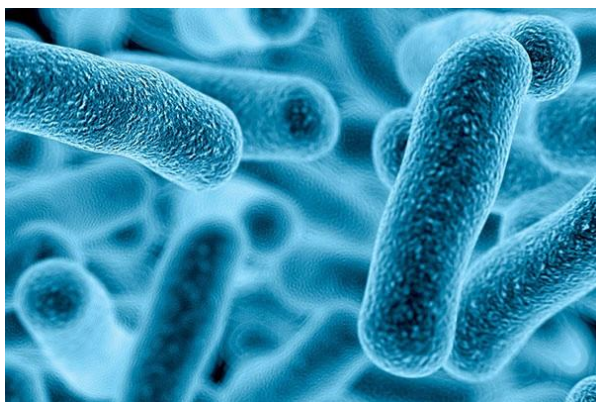
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